GAS JOURNAL

LIGHT ⁘ HEAT ⁘ POWER ⁘ BYE-PRODUCTS

(Founded in 1849 as the "Journal of Gas Lighting.")

PROPRIETORS: WALTER KING, LIMITED — OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

Telephone: Central 6055. —— Telegrams: "GASKING, FLEET, LONDON."

VOL. CLXXV., No. 3294.] WEDNESDAY, JULY 7, 1926. [78TH YEAR.

EDITORIAL NOTES.

Paving the Return Way.

THE whole of the exciting happenings in the political and labour worlds during the past week point to two things—that constitutional dealing is succeeding in the trouble through which we are passing, and that the extremists among the labour leaders see that their subversive policy is not only losing the adherence of the rank-and-file in the trade union organizations, but is in a fair way of being wrecked, or, at any rate, seriously crippled. The policy of these men has been of such an inherently bad order that it has done more than anything else to produce its own destruction; and it is the set-back it has suffered which has incensed them. The Government, however, have stood firm, with the country at their backs, and supported by the awakening of large masses of trade unionists to the perilous position to which their means of livelihood have been brought by their new fanatical leaders. The furore, the braggadocio, the menaces, and the vulgar abuse which have been heard and read during the past ten days constitute the best testimony the country could have of the hopes and intentions of these leaders having fortunately gone astray.

By 355 to 163 votes, the Mines Eight Hours' Bill had its second reading; and by 332 to 147 votes, its third reading. The Reorganization Bill is going placidly along through the Committee and other stages. The opponents by their fury over the former measure have disclosed a fine appreciation of its destined effectiveness. Their conduct in connection with it has been utterly inconsistent with their declarations. In the first place, the measure is a permissive one. It can be rejected by the miners or otherwise just as they think proper; it enables the owners to do what they could not do while the statutory seven hours remained unmodified. From the ranks of the miners, or of those who have long been unemployed, the coal owners can employ under the Bill (when it becomes an Act, as it is expected to do to-day) as many men as are necessary to meet the lower demands for British coal. The Miners' Federation, however, say that the men will not accept the eight hours; then in the name of commonsense, why all the uproar and the discreditable scenes which were witnessed last week from the Labour side of the House over a measure which will have no more effect than a scrap of waste paper? The truth of the matter is that the bad temper, the intemperate language, and the vulgar abuse (which have certified, with other recent happenings, that there are men mixed up with labour politics who are totally unfit to govern), are the direct negation of the view of the Miners' Federation. Many of the old and tried leaders in the trade union world must last week have felt sorely humiliated in being entangled or associated with men who acted in the disgraceful manner witnessed in the House.

The fact is that some thousands of miners have already returned to work. They have not done this because they are unwilling; and it is common knowledge that many thousands more are desirous of returning as soon as the owners are in a position, under the authority of the Eight Hours' Act, to engage them. The Executive of the Miners' Federation, directly they could get released from London last week, hurried back to their respective areas, with the view to much speech-making to try to prevent the men breaking away. But the men are already in the tenth week of unemployment due to their misguiding; and it will require something more than words to restore their faith in leaders who have so grossly mishandled their interests. The owners calculate that they will be able to give work to about 850,000 men on the basis of an eight-hour day, at the wages existing before the stoppage. Everything points to the fact that the continued resistance to a change in hours is not on the men's behalf, but on that of the Miners' Federation. Short-sighted leadership has let-down the miners and weakened their occupation; the anxiety of the Miners' Federation to-day is that the men shall not now let-down their incompetent leaders, who have become the laughing-stock of the world for an imbecility and blindness such as has never before been experienced in industrial history.

The General Council of the Trade Union Congress are endeavouring to utilize the present position of affairs to regain some of their lost glory and power in the trade union world. The general strike was an illegal action on their part, and exposed them personally to liabilities of a serious order, as well as the men whom they illegally ordered to break employment contracts. The industries concerned have refrained from taking action against men who—perhaps innocently, but for men in their position unpardonably—imagined that trade union authority was superior to the law of the land. We are not altogether sure that the leniency which has been shown over the unlawful attack on the country has been altogether good policy. However that may be, the Council of the Trade Union Congress have been taking advantage of the leniency and their escape to attempt to cover up their ignominious position by issuing a "Declaration on the Industrial Situation," in whch they state that the labour movement must offer a determined resistance to the attack the Government are making upon hours. Intelligent trade unionists will properly interpret the reason for this "Declaration." The Council of the "T.U.C." thought they saw an opportunity to do something to mitigate their own recent folly. The Government are making no attack on hours. Eight hours is general in industry. When the coal industry cannot live without the product of eight hours' work, there is nothing unreasonable in the miners' being called upon to operate eight hours, just as other men; and the miners are obviously reluctant to give up the employment in which they have been reared. The "T.U.C." Council warn the Government and the country that the policy now being pursued is calculated to provoke a conflict the end of which cannot be foreseen. The general strike made it painfully plain to that Council that the nation are totally unprepared to be dominated by men whom they have not appointed to govern them. The "Declaration" is a piece of bluff—a calculated means of helping the Council through the mess into which they got themselves in ordering a general strike without taking a ballot of the men, and following the legitimate course of giving employers the notice which was due to them in respect of the termination of employment—that is, where there was no direct dispute with the employers as to wages or hours. The "Declaration" has fallen very flat in the country, and among trade unionists in particular.

Now in the tenth week of the strike, stocks of British coal have run low; but there are regular deliveries of coal from the Continent and America. The mirage has faded away of an international unification of miners to

prevent the participation of this country in the distribution of the world's coal, and to enable the miners to rule the world. In the interests of the country as a whole, the Government have made arrangements for the importation of coal in large quantities from abroad. This is a better use of the country's money than subsidizing an industry to which lasting peace can never come while its rank-and-file allow themselves to be led by men whose militancy is constantly directed to a destructive and not a constructive policy. The action of the Government is another way of safeguarding industries, the interests of which are imperilled by the lack of fuel. Notwithstanding, private enterprise in purchasing and bringing coal from abroad must not cease. What the Government are doing is something to supplement the acquisition of foreign coal by big users possessing the necessary facilities, or by other concerns through the ordinary channels of coal purchase and transmission. The action of the Government is to ensure supplies of fuel, and to make them go round as far as possible. The miners of other countries are finding the policy of the British Miners' Federation has a healthy effect upon their employment, which is more than can be said for its effect upon the employment of British miners, who, we think, are beginning to appreciate the truth. The German coal industry, for example, is enjoying a "coal boom" at our expense. Its pithead stores in June were reduced by 1,500,000 tons; and thousands of additional men have recently been set to work. The Miners' Federation have served Germany well.

Breaking Down the Barriers to Development.

The address by the Rt. Hon. Sir Alfred Mond, Bart., to the Society of British Gas Industries (as published in last week's "Journal"), is something more than an ordinary presidential pronouncement, in view of the conspicuous position he holds not only in the political world, but in the world of industry, over which he maintains wide observation. He is sufficiently allied with the gas industry to be able to bring his sentient qualities to bear upon its affairs; and his views concerning it are highly valuable, whether referring to the present or the future, in relation to which he seeks to open our eyes to new possibilities.

Regarding the present, he spoke of the fact that, while the staple industries of the country have failed to maintain their progressive position, the gas industry shows a definite increase in its volume of business and services. This fact is indicative of popularity and indispensability. Figures were quoted in the address showing the position of the industry to-day; and the President stated that the gas undertakings of the country place at the disposal of the community about ten times the amount of heat energy provided by all the electricity supply stations. We rather think that is an under-estimate. If we take both the gas and the solid smokeless fuel produced by the industry's carbonizing processes, we submit that Sir Alfred is about 50 p.ct. short in his calculation of "ten times;" but, even accepting his figure, it is a remarkable and notable showing, seeing that the electricity industry is approaching its jubilee in public service. There can be no denial of the fact that the gas industry has done more than any other industry to promote a higher standard of living in the homes of the people, and yet the field for similar service is still so large that there are no means of calculating its full extent. It is because of the progress that the gas industry has made in public service that the conditions of life have been rendered more tolerable during the present coal strike than would otherwise have been the case. We may go further, and say that the tremendous strides made in the utilization of gas during the last five years have contributed to the position, in these difficult times, being more bearable than they were five years ago, when we were involved in a coal strike of similar magnitude, and, in all probability, of approximately the same duration. Yet this service is practically ignored by the Government, who, discarding all questions of economy and efficiency in the use of our coal resources, seek to boost the operations of the electricity industry in directions for which it is totally unfitted, and, in doing so, have adopted plans which our foremost electrical experts aver threaten to plunge their industry into an unholy mess.

We will pass over what Sir Alfred had to say about the coal dispute, hours and wages, co-partnership, and profit-sharing. There was much in it all that was good, and little that was controversial. We miss those matters because there are several others to which it is desired to direct attention. In the first place, there is the topic which has become a favourite one with the President during recent months. He holds that the reduction of the costs of coal at the pithead is only part of a bold scheme of re-organization—something more is wanted, and that is re-organization in selling. This is a matter upon which the gas industry will have to keep a sharp eye, as, if it develops (there are signs it may do so), it may affect it in several ways—perhaps for the better; perhaps otherwise. We cannot tell, more especially as we find that the accounts of experiences are somewhat contradictory. According to Sir Alfred, what has been done in Germany in the compulsory formation of selling syndicates has had very definite advantages. On the other hand, a writer in the "Daily Telegraph" last Wednesday stated that the difficulties confronting a selling agency are very great, and the chance of successful working is small, unless the scheme is carried out on a very extensive scale. He adds: "Such a scheme is in operation in Germany; but it is declared that the consumer in Germany has been bullied in a way which the consumers in this country would never tolerate." It is obvious that success depends very much upon the policy of the selling syndicates, which, as a result of his investigations, have greatly attracted Sir Alfred, and have convinced him of their feasibility and value. One thing we should like to know is whether the selling syndicates have complete liberty, or are under any sort of control in respect of policy, prices, and action. From what the President says, the matter is under the serious consideration of the district organizations of the Mining Association of this country; and the suggestion, he tells us, has met with a very sympathetic reception—in fact, a considerable number of coal owners have given thorough support to the proposal. Before the matter gets any farther, it would be a good thing if representatives of the principal coal buyers—say, the railway, gas, electricity, and other industries—were invited to hear and discuss the details of what has actually been done in Germany, with the results during the many years of operation. We suggest this because it is manifest that such selling organizations are capable of immense changes and development from current purchasing procedure—particularly in the matters of coal costs, and preparation of coals for buyers. The possibilities, indeed, are more far-reaching than may appear at first sight. However, it is a satisfaction to have the assurance of Sir Alfred that—

> There need be no fear that the establishment of coal-selling organizations would lead to excessive prices. Where they have been adopted in other countries, the necessary precautions have been taken to protect the interest of the consumer. Stabilization of prices does not necessarily mean undue raising of prices, either to the home consumer, or to the export market. The consumer, particularly the industrial consumer—for instance, the gas industry—is more interested in seeing ahead, for a number of years, the course of prices of raw materials than in enjoying any small temporary advantage which may be secured by abnormal conditions.

This question of coal-selling organizations, it will be admitted, is one of fundamental importance to the gas industry.

We come to points in the address in which Sir Alfred suggests that the gas industry should break through the barriers which have hitherto limited its operations. The first matter to which he refers is the one of oil from coal, which is recognized as being of large national importance, and is receiving a considerable amount of attention in high quarters of industrial movement. In this matter, the country is accused of being, we will not say hopelessly, but much behind Germany and the United States. At the same time, we know the question is not being neglected. Keen workers are engaged in investigations; and in our pages we have not hesitated to give circulation to information concerning the work they are doing, because among the possibilities, this is one, and it is of

national importance. As carbonizers of coal on a large scale, with hopes of large development, the gas industry must not ignore this matter of oil from coal, but must join, as far as is reasonably practicable, in the quest which is being made for the discovery of a process which will give us the gas and smokeless fuel which we require, *plus* a contribution to our home oil resources. This subject is bound-up very much with the utilization of low-grade coal, the provision of smokeless fuel, and the disposal of the resulting gas. They are all openings to development which must be watched very carefully by the industry. In fact, it seems to us that the National Gas Council should appoint a Committee to concentrate upon these questions with a view to enabling the industry to take any practicable steps to protect its scope for development, and any reasonable participation that opportunity offers or permits. The industry allowed the occasion to pass for linking-up to itself the supply of electricity; it must not, by negligence, lose a possible development in another direction, if by incorporation it can be of profit to the gas business generally. In this matter, as well as in that of organized selling agencies for coal, the new President of the Society (Viscount Ednam, M.C.), through his coal interests, would no doubt be quite able to assist in any watching or investigating operations should the National Gas Council consider such to be desirable.

In the work of securing a home supply of oil from coal, Sir Alfred regards the gas industry as a basic factor, as also in the scheme for central pithead stations for the treatment of coal. From these, he believes the gas industry could secure large supplies of their primary product—particularly for industrial purposes—if enterprise is shown by those who are geographically in the position to take advantage of such new sources. He has had a quarter of a century's experience of the South Staffordshire Mond Gas Company; and he knows what a demand there is for gaseous fuel for industrial work. He reminds us, too, that the gas industry itself has compiled a list of thousands of industrial processes, in which gas is already used. He is certain that the future of the industry will not be confined to the domestic business, but will depend largely upon the industrial load, which is steadily growing. In his view, there is a need, when electricity is being made a national affair, for the breaking-down of the barriers which restrict the development of the gas industry. These barriers, as he points out, are partly due to the method by which the production and distribution of gas has developed—within urban areas. The line of development has been the immediate domestic supply, and industrial requirements have generally had secondary consideration. Indeed, this critic finds that jealousy has been shown lest the industrial user should get gas cheaper than the private consumer. The industry is awakening to this matter, and has set itself to inquire into the factors which affect the charges for different classes of consumers—consumers of widely different demands. But the statutory fetters relating to charges will also have to be removed. That is a matter Sir Alfred does not touch upon; but there is no question he has in mind the making of a lower grade of gas, inasmuch as he suggests that, as heat is increasingly required for domestic purposes, and also for industrial work, a change should be made from producing a relatively small quantity of gas and a large residue in the form of coke.

It is the view of Sir Alfred that, if the time comes when electricity is produced at collieries, it will not be through the medium of steam, owing to the lack of condensing water; but it will be by the development of the gasification of low-grade coal, the gas being utilized in gas-engines, with both gas and electricity transmitted to authorized distributors. In this connection, he points to the 7000 horse-power gas engine and alternator which has been installed at the Staveley Iron Company's Works, and is operating on blast-furnace gas. This engine was installed at a less cost than a modern steam turbine plant could have been provided; and it is much more efficient. He also raises afresh expectations of the successful development of the gas-turbine. The difficulty has been to find a material which will withstand the temperatures and cutting influences to which the blades are exposed. He believes that this trouble will be overcome by the use of new high-grade nickel chrome alloys. If this is right, we may before long witness a new orientation of power production.

The facts that town gas is now on a thermal basis, and is so extensively used for domestic heating and cooking, supply reasons for looking to the development of a much more extensive business in the industrial field than the industry is enjoying at present. The success of the competition of the electric motor, suction and pressure producers, and so forth, indicates that the mode of procedure of the gas industry has been to let other people have a walk-over in the industrial field, and then itself to wake-up to what might have been. Hence the larger outlook which is urged upon the industry by Sir Alfred Mond. A parochial outlook is out of keeping with the times; a bigger outlook which compasses all possible ends is now desirable. Opinions coming from one of such calibre in the industrial world, one who has dealt with distinguished success with large enterprises, must be received with respect, and be examined with great care. Whether or not the gas industry eventually pursues any or all of the courses which he advocates for its expansion, it is under an obligation to him for giving to it the benefit of advice based on such a mature experience. We are confident the suggestions will be examined with great care, having regard to the growing recognition that it is essential in these times to provide for the future, as well as to attend to current needs.

Three-Part Tariffs.

THIS week Mr. George Evetts contributes an article which furnishes the results of an analytical investigation he has made into the application of the three-part tariff in the case of one gas undertaking in America, and then compares the results with what would obtain in this country if the same three-part tariff were introduced. In the result, he shows that the consumers would fare better here than in America, though there are some rather startling disclosures as to the incidence of charge per unit of consumption on the small compared with the larger consumers, as well as upon consumers of large consumption whose maximum demand per hour is heavy compared with consumers whose annual demand is the same, but whose maximum hour's demand is of a lower order. In studying our contributor's article there should be a clear understanding of the fact that he is not indulging in any examination of the general desirability of differential rates; nor does he make any thorough exploration of the economics of the question as a whole. The National Gas Council have this matter in hand; and there is a general feeling that, in order to gain industrial loads and larger domestic heating demands, and meet competition, a bigger incentive than the flat rate is necessary. The industry has so far failed to secure industrial custom to the extent it should do; it is still operating on the fringe of such custom. Good as is the business for domestic cooking, we cannot claim that we have succeeded in doing more than to make a start in the conversion from solid fuel to gaseous for general household heating.

Mr. Evetts is as fully convinced as anyone that the flat-rate system is inequitable; and it is so especially to the large consumers, who impose financial obligations of a much less onerous character upon an undertaking per unit of demand than a number of small consumers whose consumption only aggregates that of the large one. The particular three-part system which he takes from America is constructed on a basis with which he cannot find fault, providing the costing system is adequate, and the necessary information is at the disposal of the officials for practically applying the principles. If a system is fundamentally equitable, and all the factors taken are correct, then the result must also be equitable as between consumer and consumer. But Mr. Evetts' exercise shows that the smallest consumer in the circumstances of the American case has to pay a figure (it is not so heavy under British conditions) per unit of demand which is enough to drive away his patronage. But the fact shows that as a flat-rate consumer he has been of no genuine profit to the undertaking, and so must have been a burden upon those consumers who are profitable. Under the new system, his own enlargement of consumption would

bring down his cost per unit of demand. But the development of demand takes time; and a question of policy comes in. These small consumers would probably after a while become larger ones under the (at the start) unprofitable flat-rate system, until their consumption would become of an order at which they could be offered the advantages of the two-part or three-part system—preferably the former to avoid too much complication. While the custom of such consumers on the flat-rate system is of no use at the beginning from the profit-making point of view, a question for decision is whether it is worth while gathering them in, and retaining them, in the hope of larger patronage in the time to come. If so, then perhaps it may be considered that such tariffs as the two-part one should only be applied at a given minimum consumption. Anyway, a tariff of the kind being admittedly equitable as between consumer and consumer, those whom it will benefit, those among whom it will have a beneficial influence in developing consumption, and will therefore have a good result from the point of view of the undertaking, must not be denied such a commonsense change, seeing that competition—and in that competition the price inducement to increasing consumption—are factors in the position. In the American three-part tariff, the most unmanageable defect is that the increase of consumption per maximum hour causes an increased payment on account of the hourly concentration compared with a consumer whose hourly consumption is lower, but whose annual consumption totals to the same figure.

It is impossible here to carry comment into the numerous details composing Mr. Evetts' analytical investigation of the three-part tariff; but his final paragraph puts into a nutshell the present state of his views after indulging in his critical survey of the matter. First, he agrees that the present system of flat-rate charges is inequitable; secondly, that the substitution of a scientific method is not easy to calculate or put into operation. The fact that a definite revenue has to be earned implies an increase in charge to some consumers, if others are to benefit. He thinks a solution may be found by the gradual introduction of two or three part tariffs, coupled with freedom to calculate dividends on the average price received, after the necessary initial adjustment to the sliding-scale provisions, and giving the usual protection that all consumers in like circumstances are to have equal treatment. However, notwithstanding all criticism, the fact remains that the gas undertakings of America are almost unanimous in their declaration that the overall advantages of the two and three part systems of charging could not be obtained under the flat-rate system.

The Posen Tankless Holder Explosion.

The letter by Messrs. John Le Boutillier, Ltd., which was published in last week's "Journal," commenting upon the account given in our editorial columns on the 23rd ult. (p. 641) of the explosion of the tankless holder at Posen, is interesting both for what it says, and for what it does not say. Let it be remarked at once that we are not by any means opposed to this form of gasholder construction, providing it can be proved, beyond any shadow of doubt, that it does not embody a source of danger which is not present in other types. That is the point which requires to be threshed out and settled, in order to give complete confidence to gas engineers, who are the responsible advisers in these matters of the undertakings they serve. The letter, in the first place, informs us that the unanimous decision of 34 of the leading engineers in Germany is that the Posen holder explosion was due to no fault either of design or of workmanship. We have not suggested that there was anything in the workmanship to which objection could be taken; as an engineering structure, having regard to the characteristics of the holder, we have no doubt that it is all that could be desired. But regarding the design from the point of view of safety, the whole point is, Does it incorporate a risk which has not existed in holder construction hitherto?

We are not yet convinced that such a risk is not present, in view of the Posen accident. The event shows, in the first place, that it is possible for the disc to tilt, and that there must always be great care there is no uneven weighting. It also brings home sharply the fact that there must never be any tilting of the disc which will cause friction on the sides of the shell of the holder, and which would allow escapes of gas into the space above the disc. It is obvious that with such a space in existence, the seal round the disc must provide a joint that is thoroughly and always gas-tight, as otherwise there must inevitably be leakages from the charged part of the holder into the space above the disc, and gradually an explosive mixture will be formed there, with the result that, if a spark is caused by friction, up will go the holder. That space might become something akin to a powder magazine. Much responsibility therefore depends on the tar seal; and as the disc and the shell must be mutually contributory to a tight seal, it is obvious that any contortion of the latter through wind pressure or other cause, or considerable variations of temperature, would affect the harmonious relation of the disc to the shell, and therefore the question of leakage from the lower to the upper part. Some users of these holders appear to have been more fortunate in regard to leakages than others. Anyway, there is a seat of a risk which does not obtain in gasholders of ordinary construction. With an explosion in a holder of the tankless form, there is little chance of preventing serious disaster to the structure itself; and we can conceive a holder of the kind, located in a densely populated district, in the event of such a catastrophe, doing damage of an order which it would not be pleasant to contemplate. In the case of gasholders of normal construction, the accidents which happen to them are of comparatively moderate character; and, with the exception of replacing corroded sheets, repairs can usually be carried out without putting a holder out of action. The danger of a disc of large diameter tilting, and the risk of an explosive mixture being formed above a disc, are not present in them. If there is a leakage from an ordinary holder, it simply dissipates itself in the air. We do not want to do anything to assist in impeding the progress of new ideas and constructions in the gas industry; but it is part of our duty to try to obtain the best assurance possible that new ideas and constructions do not embody new or serious risks—if those risks are present, then it is the work of the designer to try to circumvent them. It is obvious that in these waterless holders only the most scrupulous care—care of a character not claimed by ordinary holders—will avoid the risk of something going wrong with the disc or the seal. For example, the letter in last week's "Journal" states that the sealing liquid used in the "M.A.N." gasholder must be a gas-works tar prepared to a very definite specification, designed to meet local conditions, and should not in any case contain any water. But experience suggests that the seal is a decided weakness of the system. Despite a definite tar specification for local conditions, temperature comes into play in altering its physical condition—for example, in winter the tar is more viscous than in summer, and complaints of the effects of this are not unknown. It is manifest that tankless holders require more nursing than those of the older types.

We are reminded by the Posen explosion of an article which appeared in our German contemporary on April 17, 1920, in which an illustrated account was given of an explosion of another tankless holder; but this was before it was actually brought into use. A translation is as follows: "As regards the explosion of a gasholder which "took place on Jan. 19 in Mügeln, in the district of "Dresden, the most contradictory rumours are in circu-"lation. It is a fact that on that day a waterless gas-"holder (which was being constructed by the 'M.A.N.,' "and which was not wholly finished) exploded. The cause "is to be looked for in the fact that gas got into the "holder from gas piping already completed, in a manner "which has not yet been made clear, and exploded (owing "to the formation of an explosive gas mixture) shortly "after the commencement of work. All other accounts—"such as the exploding of a welding apparatus—are in-"correct. Such apparatus has not been used in this con-"struction. From this information, it will be seen that "the accident would have occurred with any holder, and "has, therefore, nothing to do with the system of the "waterless holder."

We have seen a large number of photographs of

holders which have been erected on this system. Altogether, in different parts of the world, nearly 100 holders of this type have been, or are being, built—ranging from 35,400 c.ft. to 15 million c.ft. capacity. That should in fairness be stated. Furthermore, in order that all views may be heard, we hope shortly to publish an account of the salient statements made on the subject at the conference of German engineers who have had experience of this form of holder.

Coal Blending and Possible Developments.

ALTHOUGH there is admission of the technical advantages in carbonization of blending strongly coking and non-coking coals in proportions relative to their properties, and of the commercial benefits of producing coke of good physical characteristics for domestic purposes, no great amount of enthusiasm yet appears to have been raised over the matter in the British gas industry. However, we are glad to find that there are workers who are not going to allow the question to recede from sight. They realize that it is a primary and pressing interest to improve the physical qualities and intrinsic value of coke, and, secondly, to enhance the conditions inside retorts and ovens by breaking-down the heat-resisting plastic layer of a charge when highly bituminous coals are used, while coincidentally giving coals of present poor worth a higher place in beneficial service. There is another thing we must not overlook. It is that, if carbonizers can use more of the non-coking and poorer varieties of coal, so as to produce benefit in the two directions referred to, it will help to reduce the inroads into our stores of the better quality coal. In this country blending is practised in the coking industry (probably not in the measure to which it will develop) for the purpose of making coke for special purposes. But at the recent meeting of the Iron and Steel Institute, when Mr. David Brownlie read his paper (see "JOURNAL," June 16, p. 600), it was pointed out that the practice in our coking industry is far behind that of the United States and Germany. There is no doubt, however, that it is through blending that the coking industry sees opportunities to extend its markets for coke, and in directions in which the gas industry must see it is not adversely affected, while pursuing a *laissez faire* policy.

An important point in connection with blending is that the coals must be mixed in the right proportions and intimately—proper proportions varying with the characteristics of different coals. There has been failure to realize any particular advantage from blending through a more or less arbitrary mixing of the coals upon which experiment has been made. Where there has been success when pursuing an arbitrary course, it has been due to good fortune—nothing else. But the right proportions in which to mix two or more coals is a matter for determination by simple routine in the laboratory. In the discussion referred to, Dr. Lessing (who does not think the subject of coal blending has received the attention it deserves) made some observations which may be shadows of coming developments. In the first place, he alluded to the fact that for gas-works purposes it may be that highly bituminous coals are the most available, and that it would not be easy for some of them to secure coals of suitable properties for producing proper blending for their particular purpose. But the fact remains that most coal-fields yield coals of different inherent values. Mr. Brownlie suggests that where highly swelling coals are the most available, then part of the supply could be treated in low-temperature plant, and the resulting coke be blended with the highly bituminous coals for carbonization in the ordinary plant. We hardly think that gas-works would want to have a double carbonizing process of this sort if the same result in regard to coke could be produced by mixing coals of suitable properties. There is no doubt they will avoid, if at all possible, having a blend of carbonizing plant as well as a blend of charge.

It was Dr. Lessing who foreshadowed what might be a further development. Collieries may themselves enlarge their operations into the selling of coals blended at the pit heads. Before the collieries contemplate anything of the kind, in our opinion they had better look to improving the cleaning of coal. That is the first desideratum. Nevertheless, if the collieries find they are losing overseas trade because in other countries colliery-blended coal can be purchased, added to the advantage of the pits being able to dispose of low grades of coal by mixing them with higher grades in this way, they will undoubtedly seriously consider the question. What Dr. Lessing said was that foreigners have realized the advantages for carbonization—particularly in gas manufacture—of undertaking the blending of coals; and a result of this is that purchasers are now going to countries where blending facilities are provided, and where they can obtain mixtures from which definite results may be realized. From what he subsequently said, there is no doubt that it was Germany to which he was referring, though in the United States and in Belgium coal blending for carbonizing purposes is not a new thing. In Germany, the Coal Syndicate—speaking more particularly of the Ruhr—have the advantage of co-operation in regard to the sales of their coal, and have absolute power, as thought fit, to draw on the supplies of their members in any way, and to any extent, in respect of allocation. They can, therefore, direct suitable coals to be delivered from the various collieries at the central loading stations, and so permit of proper qualities being combined in blends as desired. They have also overcome the tendency to sell brands of coal. They sell it by quality (by numbers), and are by this means able to get even the inferior qualities into mixtures, in which they are lost or obliterated, or form a mixture of an acceptable value. Thus the German colliery owners are able to dispose of their coal completely, and at the same time satisfy their customers. But, of course, as pointed out in the discussion by Prof. Louis, we are not in this country in the same position as Germany in regard to dealing with coal, inasmuch as Germany is in the more or less fortunate position of having practically only one coalfield. It is, therefore, a simple matter for her to do in this one area what would have to be done in this country in half-a-dozen.

However, should the sale of blended coal be developed by the collieries in this country, we are afraid that it would be necessary, so far as gas-works' supplies are concerned, for them to work to a specification, which would have regard both to the properties of the mixed coals, and to the type of carbonizing plant in which the blend is to be used. On the other hand, the fact that the collieries would be using some of the cheaper coals, for which it is not easy for them to obtain markets in normal times, should result in a cheapening of the blended material, notwithstanding the cost attaching to carrying out the process of blending. It may be that in this country gas engineers would prefer the greater assurance and latitude which would be allowed them by looking after the blending on their own account. This is a direction—the mechanical method of doing the work—in which there has already been some amount of consideration; and it is hoped that before long we shall hear something about working-scale experiments and the effects realized.

At the present juncture, it is quite easy to agree that in all districts it may not be necessary to contemplate the blending of coals. It is all an economic question, with the considerations running along well-defined courses of technical advantage in the carbonizing process, and of commercial benefit in respect of coke. The question must be explored in all its phases by both the large carbonizing industries of this country. We want to displace the coal grate. Low-temperature carbonization and electricity are both making efforts to assist in this work, and so is the coke-oven industry. Are these facts of no immediate importance to the gas industry?

Lady Graduate in Gas Engineering.

It will be seen from the list of examination results and degrees and diplomas conferred at the Leeds University, at the end of the session (see later column), that the first woman graduate in gas engineering is Miss Margaret F. Eurich. She has won Second Class B.Sc. Honours (London). In congratulating her, we also compliment Prof. Cobb and the Department of Coal Gas and Fuel Industries.

Who Will Pay?

It will be seen, from the first note in "Electricity Supply Memoranda" this week, that an amendment to the Electricity Supply Bill has been accepted by the Government, which will enable the Central Electricity Board to advance, free of interest, the sums necessary to enable authorized electricity undertakings to meet the cost involved in the standardization of frequency. Who will pay the interest?

Imports of Coal.

On Monday of last week, Col. Lane-Fox, Secretary for Mines, stated in the House of Commons that the total amount of coal imported into Great Britain from May 1 to June 24 was 585,000 tons. The coal was received in the following quantities from eight different quarters: Germany sent us 221,000 tons; Belgium, 154,000 tons; Holland, 61,000 tons; France, 43,000 tons; Poland, 16,000 tons; Sweden, 1000 tons; United States, 81,000 tons; Canada, 8000 tons. Since June 24 those figures must have been considerably augmented. As a matter of fact, it is well known that very large contracts have been entered into for American coal for delivery as quickly as possible—the Government being large buyers on behalf of the nation. Some gas companies have put up the price of gas to compensate for the increased cost of the imported coal. Gas undertakings are keeping going the lighting burners, gas cookers, and other applications of gas. It is surprising to learn of the Council of one small town refusing to purchase foreign coal for gas making, although the stocks at the works are about exhausted. The Council have a strong labour element in their constitution, which probably accounts for their attitude.

Coal Exports in May.

It will probably appear somewhat strange that there were any exports of coal from this country during May. But there were; and probably the explanation is that it was due to overlapping, and to the dates when the returns were made, rather than to any actual business being done in the sale of coal to overseas countries during the period of the coal stoppage. There was, as a matter of fact, 1,448,368 tons of coal entered as exports for the month of May, which figure compares with 4,652,464 tons in May, 1925, and 5,479,875 tons in May, 1924. But 1,062,096 tons of the quantity was of the steam variety, and 120,458 tons was anthracite—leaving only 167,548 tons of gas coal, 38,581 tons of household coal, and other sorts 59,685 tons. The value of the total exported last month was £1,392,437; that of May, 1925, £4,798,756; and that of May, 1924, £6,678,328. As already mentioned, the amount of gas coal included in these figures is 167,548 tons, the value being £137,005, which works out to an average of 16s. 4·2d. per ton. The comparative figures are: May, 1925, 651,898 tons, of a value of £619,091; May, 1924, 769,291 tons, of a value of £910,773. The total exports of coal of all classes for the five months were 18,929,604 tons (value £17,191,388); in the corresponding period of 1925, 22,114,598 tons (value £23,143,815); and 1924, 26,248,766 tons (value £32,274,947). In the five months, the total amount of gas coal sent abroad was 2,491,787 tons, of a value of £2,032,988.

Gas Coke Shipments.

Regarding gas coke, the month of May naturally had a terrible fall, although the five months came out well in advance of the corresponding period of 1925. The amount of gas coke exported in May was only 4402 tons; the value being £4302, which averages 19s. 6·5d. per ton. In May, 1925, the quantity exported was 25,197 tons, of a value of £32,950; and in May, 1924, 38,616 tons, of a value of £69,203. In the five months the amount sent overseas was 367,227 tons, the value of which was £378,820. For the corresponding months of 1925, the foreign business amounted to 208,974 tons, of a value of £303,937. In the corresponding period of 1924, the quantity disposed of abroad was 408,092 tons; the value being £715,073.

Unemployment.

The number of persons recorded on the registers of Employment Exchanges in Great Britain on June 21 was 1,634,700. This was 4761 more than a week ago, and 335,033 more than a year ago. The total of 1,634,700 on June 21 is exclusive of persons who ceased work in the coal-mining industry.

PERSONAL.

Last Saturday, Mr. D. MILNE WATSON, D.L., the President of the National Gas Council and Governor of the Gas Light and Coke Company, received, at the Leeds University, the Honorary Degree of Doctor of Laws. A fuller notice of this interesting event appears in a later column.

The list of Birthday Honours includes the name of Mr. EDWARD TINDAL ATKINSON, K.C. (Railway and Canal Commissioner), upon whom Knighthood has been conferred. Mr. Tindal Atkinson's name is familiar to "JOURNAL" readers through his practice at the Parliamentary Bar.

At a meeting of the Birmingham Gas Committee, an illuminated address was presented by Alderman J. H. Lloyd (the Chairman) to Mr. PERCY JAMES, on his retirement after 43 years' service. Mr. James commenced work in the Secretary's office on June 24, 1883, and was afterwards transferred to the Fittings Section. During his long service he held the positions of Assistant Rental Clerk, District Clerk, and Rental Clerk. In 1901 he was appointed Chief Prepayment Rental Clerk, and has rendered excellent service in this capacity until the present time. During the war he did good work in adjusting and collecting accounts of prepayment consumers. It was then impossible to obtain all the meters required; and when coin attachments gave way and new meters were not available, consumers were able to obtain gas. This had to be very carefully watched, and led to many adjustments. The outstanding balances in prepayment meters to-day is down to pre-war level, notwithstanding the increase in the number of consumers; and this satisfactory state of things is due largely to Mr. James's watchfulness.

OBITUARY.

It is with regret we have to record that Clara, the eldest twin daughter of Mr. and Mrs. J. GREEN, Gas-Works, Wisbech, passed away at the North Cambridgeshire Hospital, Wisbech, on Wednesday, June 30, in her nineteenth year.

The death has taken place of Mr. J. W. HOLMES, of the Repton Gas-Works. Following a brief illness, he was removed to the Derbyshire Royal Infirmary for an immediate operation. Acute peritonitis set in, and he passed away last Thursday. Deceased went to Repton some 25 years ago, being appointed Works Manager to the Repton Gas Company; and when the concern was taken-over two years ago by the Burton Corporation, he continued in his position as Manager at Repton.

We are sorry to have to record the death of a very old friend, Mr. J. S. CRANMER, which took place on the 29th ult., after a long and painful illness. For a period of about forty years Mr. Cranmer was Manager of the Stratford-on-Avon Gas-Works, previous to which he was, for some six years, Manager of the Malton (Yorks.) Gas-Works. Great progress was made by the Stratford undertaking under his managership, which extended from 1875 to 1916, when he retired. He was preceded as Manager of this works by his brother Henry. One of his sons, Mr. W. G. S. Cranmer, is at present Engineer and Manager of the Willenhall Gas Company, and the other, Mr. A. H. Cranmer, Assistant Engineer to the Wolverhampton Gas Company. It is recorded of his father that he gave a demonstration of cooking by gas on the occasion of the celebration of peace on the termination of the Crimean War. Mr. Cranmer, who had reached the ripe age of 81 years, was one of the founders of the Midland Association of Gas Engineers and Managers.

FORTHCOMING ENGAGEMENTS.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

July 13.—NATIONAL GAS COUNCIL.—Meeting.
July 13.—FEDERATION OF GAS EMPLOYERS.—Meeting.
July 19.—INSTITUTION OF CHEMICAL ENGINEERS.—Annual meeting.
July 19-23.—SOCIETY OF CHEMICAL INDUSTRY.—Annual meeting.
Aug. 17-18.—IRISH ASSOCIATION OF GAS MANAGERS.—Annual meeting in Dublin.
Sept. 6-18.—SMOKE ABATEMENT EXHIBITION, at Birmingham.
Sept. 9.—"B.C.G.A.," MIDLANDS DISTRICT CONFERENCE.—Smethwick.
Sept. 14-16.—INSTITUTION OF PUBLIC LIGHTING ENGINEERS.—Conference at Newcastle.
Sept. 20.—EVENING STAR LODGE.—Emergency Meeting.

INSTITUTION OF GAS ENGINEERS.

July 12.—Emergency and Finance Committees.
July 13.—Advisory Committee on Education.
July 24.—Education Conference.
Sept. 21-23.—Postponed Annual Meeting.
Sept. 24.—Visit to Hastings.

HONORARY DEGREE FOR MR. MILNE WATSON.

The Degree Ceremony took place at Leeds University last Saturday, and on the occasion Mr. D. Milne Watson was presented by Prof. John W. Cobb (Pro-Vice-Chancellor and Livesey Professor in the University) for the Honorary Degree of Doctor of Laws. In doing this, Prof. Cobb said:

Mr. VICE-CHANCELLOR,—It has been one of the ambitions of this University to create for itself a tradition of service to the industrial community, and of readiness to honour in the way that lies most plainly before it a leader of industry whose record of work and achievement commands its admiration and respect.

Mr. Milne Watson studied at the Universities of Edinburgh and Marburg, graduated at Oxford in Arts and Law, and became a Barrister of the Middle Temple before entering industrial life. He then joined the Gas Light and Coke Company, and since 1918 has held the high office of Governor of that great corporation, which celebrated its centenary in 1912. The place he has made for himself in the gas industry, and the confidence he has inspired, are indicated by his position as President of the National Gas Council, the ruling body of the industry, President of the National Benzole Association, which represents an organized effort to increase as far as possible the supplies of home-produced motor spirit and liquid fuel in this country, and Chairman of the British Sulphate of Ammonia Federation, concerned with another valuable bye-product from coal indispensable to modern agriculture.

From these positions of authority, Mr. Milne Watson has consistently advocated the value of university training for industrial life, and has been a firm supporter of the collaboration in research already established by the Institution of Gas Engineers and the National Benzole Association with this University. His steadfastness of character, sanity of judgment, and passion for fair dealing have widened the scope of his activities in such directions as co-partnership in industry and membership of Government Committees and Commissions on Housing, the Civil Service, and Juvenile Education.

Mr. Vice-Chancellor, I present to you David Milne Watson, for the degree of Doctor of Laws in the University, *honoris causa*.

LEEDS UNIVERSITY.

Degrees and Diplomas Conferred.

The following degrees and diplomas have been awarded by the University of Leeds for the year 1926, in the subject of gas engineering:

Ph.D. Degree.—C. B. Marson, M.Sc., and H. T. Angus, M.Sc.

B.Sc. Honours Degree.—1st Class—W. H. Blackburn, B.Sc., and A. G. Grant, B.Sc. (Corbett-Woodall Scholar). 2nd Class—Margaret F. Eurich, B.Sc. (London).

B.Sc. Ordinary Degree.—W. R. Branson and F. J. Dent.

Diploma in Gas Engineering.—W. H. Blundstone, B.Sc., and H. W. Pullan, B.Sc.

The "Arthur Smithells" Research Scholarship has been awarded to H. T. Angus.

The Leblanc Medal has been awarded to W. H. Blackburn.

Miss Eurich is the first woman graduate in Gas Engineering.

WORLD POWER CONFERENCE.

A Sectional Meeting of the World Power Conference will be held at Basle from Aug. 31 to Sept. 8.

To enable Great Britain to participate in the future activities of the Conference on lines commensurate with the position she now occupies as the convener and organizer of the first World Power Conference, a British National Committee has been formed. Among the members are: Department of Scientific and Industrial Research, Dr. C. H. Lander; Electricity Commission, Sir John Snell, G.B.E.; Institution of Civil Engineers, Sir Charles L. Morgan, C.B.E., Sir Dugald Clerk, K.B.E.; Institution of Electrical Engineers, Mr. R. A. Chattock; Institution of Gas Engineers, Mr. Charles F. Botley; British Electrical Development Association, Mr. J. W. Beauchamp; Federation of British Industries, Sir Robert Hadfield, Bt., F.R.S.; National Gas Council, Mr. D. Milne Watson, D.L.; National Physical Laboratory, Sir J. E. Petavel, D.Sc., F.R.S.; Society of Chemical Industry, Dr. H. Levinstein.

Mr. D. Milne Watson has been appointed one of the Official Representatives of the British National Committee on the International Executive Council.

ELECTRICITY SUPPLY MEMORANDA.

THE slow progress of the Electricity Supply Bill in Standing Committee seems to be playing havoc with the nerves of some of the principal participants in the discussion. Irritation has been frequently displayed; and there have been several brushes between the Attorney-General or the Minister of Transport and some of those who are most prominent in trying to secure revision of clauses. Among the changes made since our last reference, is one in connection with clause 9, which requires authorized undertakings to deal with the question of standardization of frequency, and upon which there was a lengthy discussion regarding the cost involved in this work. In the end, the Attorney-General accepted an amendment authorizing the Central Board to advance, free of interest, the sums necessary to enable the authorized undertakers and owners to meet the cost of effecting the alteration of frequency. Some one has got to pay this interest. The question is, Who? Is it to be a responsibility of the Board, or of the taxpayers through the Government? If the latter, it is totally unfair. If it is to be a charge on the electricity supply industry as a whole, then the taxpayers cannot very well object. A further amendment accepted by the Government gives the right to appeal in cases where authorized undertakers and owners are dissatisfied with the amount of the award in regard to expenses. A great deal of discussion also took place, on Tuesday of last week, on clause 10, which makes it obligatory on the Board to supply electricity to authorized undertakings. It was stated by Lt.-Col. Sir F. Hall that his belief is that clause 10 is one of the most detrimental clauses to private enterprise. It is intervention on the part of the Government in connection with the supply of necessities to the public; and he certainly would always oppose proposals of that nature. Although the discussion was long and at times almost acrimonious, it was decided that the clause should remain in the Bill.

No Interest on Standardization Expenditure.

Probable Delay of the Bill.

It is thought in parliamentary circles that it is unlikely the Electricity Bill can pass through the Standing Committee stage, and be presented to Parliament for third reading, until after the summer recess. The Bill contains 40 clauses, with schedules; and up to the end of last week the Committee had not dealt with more than about one-third of the number, although, it may be, they have handled the more important and fundamental ones. The feeling is that everything possible to delay the Bill is being done by those who are opposed to this interference with industry by the Government; and representations have been made to the Government that there should be some effort to facilitate the progress of the measure.

A Question of Efficiency.

The "Electrical Review" appears to have got "a bee in its bonnet" regarding the efficiency of the carbonizing process on gas-works. It revives the question on the paper which Mr. H. E. Copp recently read before the North of England Gas Managers' Association, in which, referring to a straight coal-gas process, he stated that the gas produced represents 23 p.ct. of the original energy of the coal, the coke 46 p.ct., and tar 6 p.ct.—making 75 p.ct. Our contemporary holds that all the heat represented by the coke and tar should be charged against the carbonizing process, and no credit be given for it. That is reducing a serious question to absurdity. The gas industry does not trade in gas only. It places upon the market from the coal it treats not only gas, but a solid smokeless fuel; and if our contemporary carries its argument to a logical conclusion, it ought to say—and defy its critics and those who are amused—that the gas industry has no right to place to the credit of its accounts the revenue derived from the secondary products. There would be equal reason in that as in denying to the carbonizing process the thermal value contained in the secondary products. Supposing the revenue from the secondary products represents (let us say for illustration only) 50 or 60 p.ct. of the average cost of coal per ton (there are times when they have represented much more), then we could well claim, if the secondary products are to be denied a share in thermal productivity, that the actual expenditure of coal in the making of gas is only 50 or 40 p.ct. (as the case may be) of the quantity employed in the complete carbonizing process. There must be, if the argument of the "Review" is to prevail, some apportionment between the coal used for the revenue-producing gas, and the coal used for the revenue-producing coke and tar. There must be fairness in argument, and not evasion with the view of gaining a point. The object of the carbonizing process on gas-works is (says our contemporary) primarily to produce gas. Of course. But it goes on to say that the bye-products—coke and tar—are "superfluous" to that end. We cannot agree, while there is thermal

value in them, and a market for them. During the coal stoppage, gas coke has helped to fill an ugly void; and many an electricity undertaking has been thankful for the thermal value there is in the coke. The thermal value in a ton of coke is not far short of that in a ton of coal—in fact, a greater duty can be obtained from it under steam-boilers, when properly applied, than from many classes of coal. Mr. Copp was dealing, as we have said, with a straight coal-gas carbonization process. Many gas-works now steam their charges in vertical retorts, and by so doing make more gas and less coke. A large number use a good proportion of their coke for the making of water gas in separate plants—thus requiring less coal, and producing more gas from that purchased. Other gas-works completely gasify coal, and make no coke. Many gas-works utilize the waste heat of the carbonizing and water-gas plants in generating steam for the works. Our contemporary might let us know what it regards as the efficiency of gas production in all these cases. The necessary data for making computations can be obtained by a little research into reports and papers which have appeared in our columns. The exercise will probably be of educational value to our contemporary.

Municipal Wiring and Selling.

The Electrical Contractors' Association have seen from the course of events in the Houses of Parliament that it was no use "kicking against the pricks," and that they would have to relax their resistance to municipal authorities obtaining wiring and selling powers. The matter has been discussed in the Parliamentary Committee Rooms three or four times this session, and always with a disconcerting result so far as the contractors are concerned. Now in connection with the Swindon Bill, a clause has been agreed; and it is understood that it is hoped to get it inserted (maybe in a modified form) in the Electricity Bill now before Parliament—at any rate, that is as we understand the position. It is hoped that a new atmosphere has been created between municipal authorities running electricity supply undertakings and electrical contractors generally. It seems that, under their Act of 1904, the Swindon Corporation already possessed wiring and selling powers, provided the work was done through contractors. In the Bill which they have in Parliament this year, clause 51 proposed that a proviso to sub-section 1 of section 21 of the 1904 Act should be repealed, which would have relieved the Corporation of the obligation to wire premises through contractors. The matter was discussed with the Incorporated Municipal Electricity Association; and an agreement was come to by the insertion of new provisions after clause 51. By these the Corporation are not to sell apparatus except at retail prices, nor are they to sell to the trade, save where there is an electrical contractor of whom the consumer or prospective consumer is a customer or prospective customer, in which case they are to sell to the electrical contractor at trade price, or at such other price as shall be determined by a Committee, representative of the interests concerned, who shall be appointed by the Electricity Commissioners on the application of any such interests. The obligation is put upon the Corporation, so far as is practicable, to adjust the prices and charges made by them for materials provided and work done, so as to meet any expenditure by them under the powers of the section, including interest upon money borrowed for these purposes, and all sums to be applied to sinking fund for the repayment of the money. The Corporation are also separately to show in the published accounts the total sums received and expended by them under this section each year.

Bathroom Dangers.

The use of electricity in bathrooms appears to have introduced a new danger. There have been electrocutions in such places on previous occasions. Now we have the case of Jack Humphrey Whitaker, a boy of twelve years of age, who was electrocuted through touching a defective electric radiator in the bathroom in the house of his parents in Bradford. From the position of his body when found, it is thought that his feet, which were bare and probably wet, came into contact with the frame of the radiator, which had been in use for some years, and had become defective. A very thorough investigation of the matter was made by Mr. J. G. Hutchinson, the City Coroner; and his summing-up is sufficient indication of what actually took place. Among other things, he commented on the danger of amateurs attempting to repair electrical appliances, as was done in this case, with the result that the member of the family who undertook the work did not properly replace the mica washers and porcelain bushes, thus allowing a live wire to come into contact with the radiator framework. By holding the bath and touching the radiator, one would get a charge of 250 volts through the body, which the Coroner said was sufficient to cause paralysis of the organs, and, if the current continued to pass, to cause death. The position of the body suggested that this had happened. Mr. Hutchinson hoped the general public would realize the advisability of seeking expert advice when electrical appliances require to be repaired. Unless repairs are carried out by experienced persons, there is great danger of accident.

To Displace the Wasteful Hotplate.

A time ago there was in some quarters of the electricity industry strong advocacy for the supply of a self-contained electric kettle with the electric cooker, with a view to securing greater efficiency, compared with boiling an ordinary kettle on a heating element of the cooker hotplate. Professor S. Parker-Smith, who has been prominent in connection with his "all-electric" house, has designed a new cooker with an adjunct for boiling operations. He states that the unsatisfactory feature of the standard type of electric cooker is the boiling-plate, whether open, protected, or enclosed. The boiling-over of a fatty liquid will easily put out of action the open type; while slowness of operation is the characteristic of the enclosed type. In view of the fact that the boiling-plate accounts for the largest part of the electricity consumption for cooking, it follows that the cost is often far too high, and out of all proportion to what it should be. In fact, Prof. Smith says the efficiency of the cooker may be as low as 0·2 to 0·3 p.ct. When we have been guilty of making assertions as to the low over-all efficiency of the electric cooker, our electrical contemporaries have sometimes seen fit to kick and abuse us without mercy; but now that such an authority as Prof. Smith gives expression to the truth, we see no evidence of offence on the part of the same contemporaries. Our Glasgow friend, from experiments spread over several months with all sorts of boiling-plates, says he has been convinced that the loss and slowness associated with the boiling-plate starting from cold arise mainly from its large heat capacity and poor heat transference, and that it is a very difficult matter with a boiling-plate to combine safety with speed and economy. He has, therefore, designed an arrangement of three boiling pots, respectively of 3, 6, and 9 pint capacity, which embody the heat elements, and are arranged for three-heat control. These are used on a cooking-bench, consisting of a metal frame with a polished aluminium top, so that any pot on the table is earthed with the bench. At the back, sockets are fitted to take the three-pin plugs of the utensils. On top of the oven, the grill remains the same, and one boiling-plate of the enclosed type has been retained to enable cooking operations to be carried out for which self-contained utensils are not suitable. Naturally, there should be economy of energy by the use of the self-contained utensils. Prof. Smith gives the following comparison: With a standard table type cooker, the average of 35 weeks' consumption equalled 60·3 kw.-h.; the average of 10 weeks with cooker and self-contained utensils equalled 24·9 kw.-h. We would point out that the 35 weeks extended from July 12, 1924, to the following March 14, which covered the whole winter season, whereas the ten weeks were in a warmer period—from March 13 to May 22 this year. We do not suggest that this will account for a great deal of difference; but, in the latter period, the atmospheric temperatures were no doubt higher than during the greater part of the 35 weeks, from which the average with a standard table type cooker was obtained. However, Prof. Smith states that attempts are also being made to obtain a more efficient oven, which shows that, from the efficiency point of view, he is not altogether satisfied with that part of the ordinary cooker. In the "Cooking and Heating Notes" of the "Electrical Times," "Hotspot" indicates that he is afraid these self-contained cooking utensils will not be altogether popular. He sees various accidents happening. He also finds a disadvantage in the additional cost, compared with competitive gas appliances. We may add that probably the cost of maintenance will also be greater, while stand-by utensils will be necessary. Altogether, notwithstanding that he admits the increased efficiency by the new method, "Hotspot" is not very hopeful of commercial success. We agree with him.

Office Heating for Nothing.—How offices have been heated for nothing, by substituting gas for coal, and utilizing for strong room and filing purposes the basement which would otherwise have been required for fuel storage, can be gathered from No. 148, of the British Commercial Gas Association's "Thousand-and-One Uses for Gas," which deals with office and house equipment in a manner which will be helpful to gas undertakings.

Institution of Chemical Engineers.—The annual report of the Council shows a growth of membership, including all grades, during 1925 from 252 to 320. Of the latter number 36 are graduates and students. On Friday afternoon, July 23, there is to be a trip by steamboat to Greenwich, for the purpose of visiting the Royal Naval College. The cost of the trip, including tea, is 7s. 6d.; and early application should be made for tickets.

THREE-PART GAS RATES.

By GEORGE EVETTS, M.Inst.C.E., M.Cons.E.

In the "JOURNAL" of June 2 (p. 459), a paragraph appeared describing the transition from the flat rate to the three-part rate (which is now so popular in America) relating to the town of Fort Collins in Northern Colorado. In view of the interest being taken in this country in differential rates, either two part or three part, it might be of value to investigate the basis on which this particular rate is framed, and the charges which are made, seeing that it is the most recently published tariff. Although two, three, and even four part tariffs are popular in America, it must not be thought that they have been unconsidered in this country, seeing that probably the pioneer work in this respect has been carried out by Mr. McLusky at Perth and Halifax.

It is not intended in this article to enter into the general desirability of differential rates, or to study the economics of the question as a whole. The National Gas Council have these matters under consideration; and it is generally felt that in order to gain industrial loads, and large blocks of domestic heating of a special nature, some incentive beyond the flat rate is necessary. The legislation of the industry in this country will probably render the change more difficult than in America; but it is agreed all round that some change must be instituted to enable the gas undertakings to offer the necessary attraction for new business.

It is the intention in this article to enter into a detailed criticism of the actual charges, and contrast them with a British company in similar circumstances. The charges actually proposed are:

1.—A commodity charge per 1000 c.ft. of 40 c., or 1s. 8d. per 1000 c.ft., measured by the meter.

2.—A customer charge per annum of £9, or 37s. 6d., payable in equal monthly instalments.

3.—A demand, capacity, or reservation charge per annum for each c.ft. of maximum hourly demand, of 32 c., or 1s. 4d., payable in equal monthly instalments.

Upon an examination of the structure of the tariff as apart from the actual charges, no complaint can be made against it. If the costing system in an undertaking is adequate to frame such a structure equitably, and the necessary information is at the disposal of the officials, it will be agreed that the method of charge is as near the ideal as possible.

First, the customer has to pay something in order to have a call on a certain quantity of gas. Therefore the supplier is guaranteed some return on the capital he has to expend and the organization he has to create in order to give the service to customers. The gas is always on tap up to a certain quantity; and the consumer has to pay his proportion up to the limits of his demand. Secondly, there are certain charges which large and small customers alike entail, such as office accommodation, meter readings, stationery, and a large proportion of what are generally called "overhead charges." The large customer occasions no more trouble to the staff than the small one, and very often less, and to have to contribute to this expenditure in pence per 1000 c.ft. is obviously unfair. Thirdly, there are certain charges common to every 1000 c.ft. of gas produced; and in general it may be stated that the purchaser of 1000 c.ft. entails the same cost *pro rata* as the purchaser of 1 million c.ft. This is defined in the tariff as the "commodity" charge. It will be clear that if any set of accounts be examined, certain charges would stand out clearly as coming under the first, second, or third headings. On the other hand, certain charges would be on the border line, and probably different accountants or engineers would have different opinions as to which category should bear the charge; but most of these items would be relatively unimportant, and would only affect the incidence of the charge to a very small extent.

Table I. shows how a consumer's annual account is made up for quantities varying from 3000 to 200,000 c.ft. per annum with the maximum hourly demand varying from 18 to 200 c.ft., conforming, so far as can be ascertained, to the ratio of maximum hours to the year, as are met with in this country. At Fort Collins the specified standard quantities range from 22½ to 300 c.ft. an hour; but this article proposes to deal only with domestic consumers, and there are few whose maximum hourly demand exceeds 200 c.ft. Neglecting the consumer taking 3000 c.ft., it will be seen that the average cost per 1000 c.ft. varies from 9s. 5d. to 3s. 2·2d. As will be shown later, the net gas rental of such an undertaking would be about 4s. 6d. per 1000 c.ft.; and to our ideas it seems a bit steep to expect 9s. 5d. from a 10,000 c.ft. consumer and 6s. 2·5d. from a 20,000 c.ft. consumer. On the other hand, the average domestic consumer of about 40,000 c.ft. comes out very well at 4s. 7·2d.

It will be seen that in the case of the consumer taking 10,000 c.ft. per annum it is estimated that his year consists of 333 maximum hours, or (say) one hour per day; whereas in the highest the year consists of 1000 maximum hours, or nearly 3 hours per day. These figures will be found to be approximately correct for English conditions, as it is obvious that a domestic consumer taking such a large quantity as 200,000 c.ft. per annum must be burning gas for a fair number of hours a day in considerable amounts.

TABLE I.

Consumption per Annum in C.Ft.	Customer Charge per Annum.	Demand Charge.		Commodity Charge per Annum at 1s. 8d.	Total per Annum.	Average per 1000 C.Ft.
		Max. per Hour.	Total per Annum.			
	£ s. d.		£ s. d.	£ s. d.	£ s. d.	s. d.
3,000	1 17 6	18	1 4 0	0 5 0	3 6 6	22 2
10,000	1 17 6	30	2 0 0	0 16 8	4 14 2	9 5
20,000	1 17 6	40	2 13 4	1 13 4	6 4 2	6 2·5
40,000	1 17 6	60	4 0 0	3 6 8	9 4 2	4 7·2
70,000	1 17 6	90	6 0 0	5 16 8	13 14 2	3 11
100,000	1 17 6	120	8 0 0	8 6 8	18 4 2	3 7·7
150,000	1 17 6	180	12 0 0	12 10 0	26 7 6	3 6·2
200,000	1 17 6	200	13 6 8	16 13 4	31 17 6	3 2·2

It is of interest to tabulate the cost of gas for various classes of consumer, taking gas at various maximum rates per hour; and Table II. shows the annual expenditure and cost per 1000 c.ft. of three classes of consumer, with gas at varying rates of maximum demand:

TABLE II.

CONSUMER NO. 1.—40,000 C.FT. A YEAR.

Max. per Hour.	Customer and Commodity.	Demand.	Total.	Average per 1000 C.Ft.
	£ s. d.	£ s. d.	£ s. d.	s. d.
30	5 4 2	2 0 0	7 4 2	3 7·2
40	5 4 2	2 13 4	7 17 6	3 11·2
60	5 4 2	4 0 0	9 4 2	4 7·2
80	5 4 2	5 6 8	10 10 0	5 3·2
100	5 4 2	6 13 4	11 17 6	5 11·2

CONSUMER NO. 2.—100,000 C.FT. A YEAR.

	£ s. d.	£ s. d.	£ s. d.	s. d.
40	10 4 2	2 13 4	12 17 6	2 6·9
80	10 4 2	5 6 8	15 10 10	3 1·3
100	10 4 2	6 13 4	16 17 6	3 4·5
120	10 4 2	8 0 0	18 4 2	3 7·7
150	10 4 2	10 0 0	20 4 2	4 0·5
200	10 4 2	13 6 8	23 10 10	4 8·5

CONSUMER NO. 3.—200,000 C.FT. A YEAR.

	£ s. d.	£ s. d.	£ s. d.	s. d.
80	18 10 10	5 6 8	23 17 6	2 4·6
100	18 10 10	6 13 4	25 4 2	2 6·2
120	18 10 10	8 0 0	26 10 10	2 7·8
150	18 10 10	10 0 0	28 10 10	2 10·2
200	18 10 10	13 6 8	31 17 6	3 2·2
300	18 10 10	20 0 0	38 10 10	3 10·2
400	18 10 10	26 13 4	45 3 4	4 6·2

In the first section, it will be observed that for every 10 c.ft. increase per maximum hour, the cost of gas will be increased by 4d. per 1000 c.ft. on the average. In the case of the second consumer, however, the same increase in the maximum demand only increases the cost by 1·6d.; and in that of the last consumer, only 0·8d. In this table, also, the graduations of average price per 1000 c.ft. are rather steep according to English ideas, and would suggest that the section of the tariff relating to demand requires some investigation.

In comparing the first and second sections of the above table, it will be seen that a consumer taking 100,000 c.ft. per annum, requiring not more than 40 c.ft. per hour (2500 hours), has a total account of only £1 more than the consumer who takes 40,000 c.ft. at 100 c.ft. an hour (400 hours). It is remarkable that, by spreading the requirements over six times the number of hours per annum, the cost would work out at considerably less than one-half, when expressed in pence per 1000 c.ft. The same remark applies to a comparison between Nos. 2 and 3 groups. The consumer of 200,000 c.ft. per annum, taking it at the rate of 80 c.ft. an hour, pays practically the same amount as the consumer taking half that quantity at a maximum rate of 200 c.ft. an hour. In fact, in the first group the demand cost is equal to more than the customer and commodity cost in the last two rates of consumption chosen. The same applies to the third group; whereas in the second group the demand cost is practically equal to the customer and commodity cost for 150 c.ft. an hour, but is considerably more for 200 c.ft. an hour. The basis of calculation for the demand cost will be considered later.

In order to compare the relative effect of the American scale with a typical British undertaking, it is first necessary to equate the total revenue; and for this purpose an assumed number of

consumers of varying quantities of gas must be taken for (say) 1 million c.ft. of gas, and the average gas rental ascertained :

TABLE III.

Number at Varying Amounts.	Total Quantity.	American.		British.	
		Rate.	Revenue.	Rate.	Revenue.
	C.Ft.	s. d.	£ s. d.	s. d.	£ s. d.
2 at 10,000 c.ft. .	20,000	9 5	9 8 4	6 5·5	6 9 2
6 at 20,000 ,, .	120,000	6 2·5	37 5 0	5 4·1	32 1 6
6 at 30,000 ,, .	180,000	5 1·7	46 5 6	4 10·8	44 2 0
7 at 40,000 ,, .	280,000	4 7·2	64 9 4	4 8 1	65 9 7
2 at 60,000 ,, .	120,000	4 3·5	25 15 0	4 4·6	26 5 10
1 at 100,000 ,, .	100,000	3 7·7	18 4 2	4 1·75	20 14 7
½ at 160,000 ,, .	80,000	3 4·8	13 12 0	3 11 1	15 14 3
½ at 200,000 ,, .	100,000	3 2·2	15 18 9	3 10·3	19 5 8
25 at 40,000 average	1,000,000	4 7·4	230 18 1	4 7·2	230 2 7

In the above table the British rate is calculated at 4s. 5½d. per 1000 c.ft., or 10·7d. per therm, with the scale of discounts mentioned below, *plus* a customer or standing charge of £1 per annum. The revenue works out practically the same; the British amounting to 7½d. per consumer per annum less.

The following is the scale of discounts on which the table has been based; and Table IV. gives the corresponding annual costs of various grades of consumers as given in Table I. :

Discount up to 10,000 c.ft. per annum	*Nil*
From 10,000 to 20,000 c.ft.	5 p.ct.
From 20,000 to 40,000 ,, ...	10 ,,
From 40,000 to 100,000 ,, ...	15 ,,
From 100,000 to 200,000 ,, ...	20 ,,

TABLE IV.—*Standing Charge and Discount Basis.*

Consumption per Annum	Customer Charge.	Average Gas Charge.	Total Gas.	Total Annual Cost	Average per 1000 C.Ft.
	£ s. d.	s. d.	£ s. d.	£ s. d.	s. d.
3,000	1 0 0	4 5·5	0 13 4	1 13 4	11 1·3
10,000	1 0 0	4 5·5	2 4 7	3 4 5	6 5·5
20,000	1 0 0	4 4 1	4 6 11	5 6 11	5 4 1
40,000	1 0 0	4 2·1	8 7 1	9 7 1	4 8·1
70,000	1 0 0	4 0·2	14 0 10	15 0 10	4 3·6
100,000	1 0 0	3 11·3	19 14 7	20 14 7	4 1·75
150,000	1 0 0	3 9·8	28 2 11	29 2 11	3 11·4
200,000	1 0 0	3 9 1	37 11 3	38 11 3	3 10·3

On comparing this with Table I., it will be seen that the change in the rate is much less steep. The consumer taking 10,000 c.ft. per annum only pays 69 p.ct. of the American scale, whereas the 200,000 c.ft. consumer pays 121 p.ct. The ratio of the average charge for largest to that for smallest (excepting the 3000 c.ft. per annum class) is 34 p.ct. in the American table and 58 p.ct. in the British table.

BASIS OF THE TARIFF.

The next step will be to compare the American scale of charges with what would be considered equitable in this country, having regard to our system of costing, and using the same principles—*i.e.*, that the consumer should pay :

(1) The full " demand " charge based on the maximum hour.
(2) The " customer " charge.
(3) The " commodity " charge.

In order to compare the systems, it is necessary to choose a typical British undertaking having a net gas rental, *plus* meter rent, equal to 11d. per therm, or to allow for the industrial consumption (say) 10·8d. per therm over-all (54·0d. per 1000 c.ft.). The following details of such an undertaking will be necessary to allocate the costs :

Annual make . .	750,000,000 c.ft.	Annual sale . .	700,000,000 c.ft.
Maximum day .	3,000,000 ,,	Maximum hour .	360,000 ,,
Capital employed	£385,000	Capital per million sold . .	£550
Ditto, excl. stoves and slot fittings	£280,000	Capital per million sold . . .	£400
No. of consumers : Ordinary and prepayment .	17,500	Domestic taking .	600,000,000 c.ft.
Industrial . .	500	Industrial and public lighting taking . . .	100,000,000 ,,
Total . .	18,000		700,000,000 c.ft.

Annual Expenditure (excluding R. & M. Stoves and Fittings)

Item No.			Per 1000 C.Ft. Sold.
		£	d.
1	Net coals	44,000	15·09
2	Carbonizing wages and purification	11,500	3·95
3	Works salaries	2,500	0·86
4	Works repairs	30,000	10·28
5	Cost into gasholder	88,000	30·18
6	Distribution salaries and wages .	2,000	0·69
7	R. & M. mains and services . . .	9,500	3·26
8	Meter repairs	6,500	2·23
9	Rent, rates, and taxes	17,000	5·83
10	Directors and auditors	2,500	0 86
11	Office and staff salaries	1,500	0·51
12	Collection	2,500	0·86
13	Stationery and general charges . .	3,200	1·10
14	Superannuation and co-partnership	3,800	1·30
15	Sundries, bad debts, &c. . . .	1,500	0 51
		138,000	47 31
16	Dividends and interest	19,500	6·69
		£157,500	54·00

Commodity Cost.—It will not be disputed that the majority of " cost into gasholder " figures should be taken as commodity cost. Part of the wages and salaries and repairs to gasholders should be considered as demand cost, as well as boosting charges, if any are represented in the above costs. For the purposes of this estimate, it must be assumed that £4000 a year, or 1·38d. per 1000 c.ft., can be deducted from the cost into gasholder, leaving £84,000, or 28·80d. per 1000 c.ft., as a fair commodity cost. The other items which can be claimed as coming under this heading are part of item No. 6 (say, one-third), item No. 9 (say, one-half), item No. 10, item No. 11 (one-half), item No. 14, item No. 15 (one-half), item No. 16 (say, one-third). The total of these charges then becomes £107,467, or 36·85d. per 1000 c.ft.

Customer Cost.—The charges taken under this heading are : Items Nos. 6, 7, and 8 (one-third), items Nos. 9 and 11 (one-half), items Nos. 12 and 13, and item No. 15 (one-half). These amount to £21,699, or 7·44d. per 1000 c.ft., or 23s. 3d. per consumer per annum.

Demand Cost.—The balance of the expenditure—*i.e.*, £4000 of costs into gasholder, *plus* item No. 6 (one-third), items Nos. 7, 8, and 16 (two-thirds)—amounts to £28,334 in all, or 9·73d. per 1000 c.ft.

There are several ways of assessing the demand cost as between different classes of consumer. In this typical undertaking, the maximum hour is 360,000 c.ft. Having ascertained the maximum hourly demand of each consumer, it is obvious that the total of these requirements will be more than the actual maximum hourly send-out, since all consumers will not take the maximum during the same hour. It can be ascertained proportionately, or by a calculation worked from a line of minimum demand, or alternatively a line of average demand. For the purposes of this present calculation, we will assume that each million c.ft. requires the number of consumers in respective grades according to Table III., taking gas according to the maximum hourly rates in Table I.

Combining these calculations, each million c.ft. entails a maximum hourly reservation charge of 1480 c.ft. an hour, or with the industrial consumption (say) 1600 c.ft. an hour. For a sale of 700 million c.ft., therefore, the total is 1,120,000 c.ft. per hour; but in fact the maximum hour is only 360,000 c.ft., or one-third of the added totals. Therefore, the annual sum of £28,334 divided by the total of 1,120,000 c.ft. becomes 6·08d. per c.ft. of maximum demand based on the consumer's total figures, or 18·9d. per c.ft. based on the actual maximum hour.

Thus, in round figures, the result of this short investigation into the costs is :

(1) A commodity charge of 3s. 1d. per 1000 c.ft.
(2) A customer charge of £1 3s. 3d. per annum.
(3) A demand charge of 6d. per c.ft. per hour, paid annually.

This should now be contrasted with the American scale given in Table I. and the standing charge and discount scale as shown in Table IV.

It will be seen that in this last method the graduations are a little more steep than in the " standing charge and discount "

TABLE V.

Amount per Annum.	Maximum per Hour.	American Scale.		Standing Charge and Discount.		Three-Part British Scale.			
		Total.	Rate per 1000 C.Ft.	Total.	Rate per 1000 C.Ft.	Customer and Demand.	Commodity at 3s. 1d.	Total.	Rate per 1000 C.Ft.
C.Ft.		£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.
3,000	18	3 6 6	22 2	1 13 4	11 1·3	1 12 3	0 9 3	2 1 6	13 10
10,000	30	4 14 2	9 5	3 4 7	6 5·5	1 18 3	1 10 10	3 9 1	6 10·9
20,000	40	6 4 2	6 2·5	5 6 11	5 4·1	2 3 3	3 1 8	5 4 11	5 3
40,000	60	9 4 2	4 7 2	9 7 1	4 8·1	2 13 3	6 3 4	8 16 7	4 5
70,000	90	13 14 2	3 11	15 0 10	4 3·6	3 8 3	10 15 10	14 4 1	4 0·7
100,000	120	18 4 2	3 7·7	20 14 7	4 1·7	4 3 3	15 8 4	19 11 7	3 11
150,000	180	26 7 6	3 6·2	29 12 11	3 11·4	5 13 3	23 2 6	28 15 9	3 10·1
200,000	200	31 17 6	3 2·2	38 11 4	3 10·3	6 3 3	30 16 8	36 19 11	3 8·4

scale; but the difference is not material, and by a slight amendment in the discounts the scales might be brought even nearer. For all consumers above 10,000 c.ft. there is never more than 2d. per 1000 c.ft. difference. It is certain that either the second or the third scale is more acceptable to British ideas than the first or American scale.

Without knowledge of the facts, it is difficult to say how the American rate structure is built up, and how it is that, with a rental of about 53·5d. per 1000 c.ft., the commodity charge becomes so low as 1s. 8d. per 1000 c.ft., and the demand charge as much as 1s. 4d. per c.ft. of maximum hour. It is certain that much of the "cost into gasholder" item is taken into the "demand" portion of the costing. If approximately one-half of the cost into holder were allocated to the demand cost, together with the whole of the capital, excluding meters, and the costs previously mentioned were added in, then the demand cost would reach 16d. per maximum c.ft., and the commodity cost be reduced to 1s. 10d. per 1000 c.ft.

It is difficult to see where the customer charge of 37s. 6d. per annum is justified, according to our methods of calculation; but it is probably accounted for by a higher consumption per consumer, and high staff wages and similar standing charges. In order to make our figures come up to 37s. 6d., it is necessary to add 14s. 3d. per consumer, or £12,800 a year.

It has not been the intention in this contribution to discuss a scientific method of analysis of accounts for a three-part tariff, but only to examine the effects according to British ideas of charging. There must be many varying methods of dissection, and probably the "demand" element can be open to the widest interpretation. There are many ways of reckoning the gross requirements in revenue for this element, and also (as before mentioned) in allocating this fairly as between consumers. For instance, it may be argued that it would not be unreasonable to take all capital charges on works and mains as a function of the "demand," as well as the wages and salaries and most of the works charges, except the actual raw materials.

The rates and taxes offer a wide field for argument. The rent (on which the rate is based) may be taken as a return on the capital invested by the landlord, and is consequently a demand charge, being part of the cost of capital for constructing the works. On the other hand, it may be argued that in an equitable basis of charging the profit grows as the business grows; and as the rates are based on profits, then the rates should be taken as a "commodity" charge. According to our method of rating, however, the relation which profit bears to rates varies according to the capital of the tenant; a large profit may not necessarily mean a high rate.

Sufficient has been given in this brief survey, however, to show that the present system of flat rate charges is inequitable, and that the substitution of a scientific method is not easy either to calculate or to put into operation. The fact that a definite revenue has to be earned, implies an increase in charge to some consumers if others are to benefit. A solution may be found by the gradual introduction of a two or three part tariff, coupled with freedom to calculate dividends on the average price received, after the necessary initial adjustment to the sliding-scale provisions, and giving the usual protection that all consumers in like circumstances are to have like treatment.

VALUATION FOR LOCAL ASSESSMENT OF MUNICIPAL GAS-WORKS.

Sums Contributed from Gas Profits to other Municipal Departments.—Deduction Allowed in Fixing Valuation.

By J. W. NAPIER, of Alloa.

The following Scottish case is not without interest and importance to local authorities as owners of trading departments, in cases where the gross profits earned are always taken as the basis of valuation for assessment.

There are a number of authorities who, by Statute, are entitled to make payments from one department to another department whose financial position may, from time to time, require assistance. Or it may be that a regular contribution is made year by year, and is looked upon as a permanent obligation to be met. Sums transferred may be raised, for example, by (*a*) extra rates imposed upon, say, consumers of gas, or (*b*) sums of varying amount as are available from the profits of a gas or other department without any extra rate having been specially levied. In the latter case, as municipal trading departments are not supposed to make profits, any sum contributed would, of course, be the equivalent of an extra rate to consumers. It is of some concern that money raised, not for the financial needs of the particular department gifting the sums, but on behalf of another department, should not be subject to inclusion in determining the valuation.

The case is that of the Alloa Town Council and the Assessor of Railways and Canals, in the matter of the sum of £5000 raised from the gas rates to meet the deficit in the Electricity Department. Under section 52 of the Corporation Electricity Provisional Order, it is, *inter alia*, provided that any deficiency of income, in any year, not answered out of the reserve fund, shall be charged upon, and payable out of, the local rate. The Electric Lighting (Scotland) Act, 1890, provides that, in a place within the jurisdiction of a town council empowered by a General Act to supply gas, "the local rate" shall be the gas rates leviable and gas rents and other revenue receivable. At various times sums have been taken from the gas revenues to meet the deficits of the Alloa Electricity Department, and in particular for each of the years 1923-24 and 1924-25 a sum of £5000 was so taken.

The Railway Assessor, in determining the valuation of the gas-works for assessment purposes, followed the revenue principle as usual, and until now has excluded from the income of the Gas Department the sums handed over for electricity. For his valuation for 1926-27, the Assessor intimated that the valuation proceeded upon the *total* revenue raised by means of gas rates. He contended that the payment of £5000 does not constitute part of the gas working charges, and the inclusion of the sum mentioned in the total revenue upon which the valuation is founded appears to be governed by Lord Skerrington's decision in the recent Edinburgh Water-Works appeal case—Parish Council of the City of Edinburgh against the Assessor (*vide* "Poor Law Magazine," June, 1925, p. 140, Supreme Court Decisions Section). The Assessor pointed out that by this decision the total revenue raised by means of the gas rates fell to be brought into the computation of the gas-works valuation. He further stated that if it could be shown that the same £5000 has been dealt with twice for valuation purposes—once by the local Assessor in connection with the valuation of the electricity works, and again by himself for the gas-works—he would be prepared to consider the claim put forward. The decision of Lord Skerrington, it should be stated, was against the Assessor—viz., that he did wrong in excluding from his valuation revenues derived from assessments for whatever purpose or particular manner used, and which would undoubtedly be taken into account by the hypothetical tenant. It was because of this decision against him that the Assessor decided to take the total gas revenues, and not to exclude any portion.

It was held by the Town Council that the case referred to can be clearly distinguished from the present case. In the Edinburgh case, the revenue excluded by the Assessor did form part of the ordinary revenues of the water undertaking which had been applied to interest and sinking fund in respect of expenditure on (1) works which were still incomplete and incapable of yielding revenue; and (2) lands and heritages acquired, but not used for the purposes of the water undertaking. In the present case the money was raised by the Gas Department, under statutory authority, expressly to meet the needs of the Electricity Department. It was not revenue to be used for the needs of the Gas Department to meet its own interest and sinking fund charges, or for any part of its own legitimate expenditure. A hypothetical tenant of the gas-works would discount the sum raised for the Electricity Department. The Town Council decided to ask Counsel—

> "Is the Assessor of Railways and Canals right in his contention that the sum specifically raised to meet the electricity deficit should be included as part of the revenue in determining the valuation for assessment of the Gas Department?"

The two eminent Counsel to whom a memorial was sent answered the question in the negative. They were of opinion—

> "That the former procedure of the Railways and Canals Assessor in applying the 'revenue principle' to the valuation of the Alloa gas undertaking was clearly right, and there is no warrant, on properly deducible form, in the judgment of Lord Skerrington in the case of the Edinburgh Parish Council for his proposed departure from that procedure. The Town Council, by virtue of their statutory electricity powers, raise the £5000 in question through the medium of gas rating; but that does not make the sum part of the gas revenue for the purpose of computing the due rent of the gas undertaking. The error of the Assessor is, we think, at once and clearly established by reference to the conception of a hypothetical tenant. Such tenant would have no relation to the electricity undertaking, and it would be *ultra vires* of him to raise the additional sum which does not represent a charge for gas at all."

The Railway Assessor, to whom the opinion of Counsel was communicated, having reconsidered the position, decided to eliminate the sum of £5000 raised by the Gas Department for electricity purposes. While the case has not the authority of a decision of Judges of the Lands Valuation Appeal Court, it may nevertheless be considered as decisive on the important principle involved. It should be added, in order to complete the statement of the whole position, that the valuation of the Electricity Department has been put, until now, at only a nominal sum, with no regard to the profit basis, and, of course, no inclusion of the £5000 as income from the Gas Department.

NATIONAL BENZOLE ASSOCIATION.

Third Annual Report of the Research Committee.

Reviewed by Dr. W. B. DAVIDSON.

The results of the third year's work of the Joint Benzole Research Committee are embodied in this report, and the researches carried out show that the excellent standard of previous years has been fully maintained. The report is divided into four parts, each dealing with separate investigations.

Continuing on the lines followed in the first and second reports, which dealt with silica gel and active carbon, the use of ferric oxide gel as an adsorbent for benzole recovery is examined. Three samples of ferric oxide gel were tested, two prepared in the laboratory and the third made by a patented process. The latter sample was less brittle and more resistant to powdering than the other two.

The results indicate that ferric oxide gel has a fairly high adsorptive capacity for benzene when concentration of the benzene in the gaseous mixture approaches saturation. Under benzole recovery conditions, however, the quantity of benzene adsorbed, calculated either on the adsorbent space or on the weight of adsorbent, is less than that adsorbed either by active carbon or silica gel. The selectivity of ferric oxide gel for sulphur compounds is suggested as a subject for further investigation.

The second and most important section of the report deals with resin formation in benzoles, and constitutes a skilful and practical investigation into the stability of benzoles, and the causes of formation of resin deposits. The constituents present in crude benzoles and petrols which primarily give rise to resin formation appear to be chiefly the unsaturated hydrocarbons. For the estimation of the latter, removal by sulphuric acid was regarded as the best approximation to a quantitative determination, and details of the apparatus and method used are given. The possible causes of gum formation suggest the lines of research followed: Oxidation, both on storage and during use, may play a part in the formation of resins; the formation of aldehydes by oxidation of certain of the unsaturated hydrocarbons may occur, and these aldehydes can then form condensation products with phenols and other constituents of the crude benzole; traces of phenolic substances derived from the wash oil are known to oxidize easily, producing black resinous material.

The "copper dish" test as a method for determining the gum-forming constituents in benzoles was tried, but was found to be open to several objections. The weight of gum from a well-refined benzole is too small to be estimated with any degree of accuracy, and the results obtained by the test indicate the amount of resin already present in the benzole, but give little indication of the total amount of resin which would be formed on further storage.

As sulphuric acid produces coloured compounds when shaken with benzole containing unsaturated constituents, a colour test, using standards consisting of potassium bichromate dissolved in 50 p.ct. sulphuric acid, was investigated, but found to be suitable only with benzoles in which a very small quantity of unsaturateds was present.

An interesting stage in the research was that concerned with the action of ultra-violet light on crude benzoles. A 2000-c.p. mercury vapour lamp of fused quartz was used, and positions of uniform intensity were found under the lamp by exposing an acid solution of potassium iodide in a stoppered silica bottle for a definite time, and titrating with thiosulphate the iodine liberated by the ultra-violet light. 100 c.c. of the benzole, contained in a weighed glass dish, was exposed in these positions for about two hours, after which the benzole was evaporated on the water-bath and the gum weighed. It was found that gum formation increases rapidly at first, but becomes slower with longer exposure.

In order to study the tendency of benzoles to form resins by heat and oxidation, a test was devised in which the benzole vapour, mixed with air, was passed through a tube packed with suitable material, and heated to 350° C. The contact materials tried were silica gel, iron turnings, pumice, and porous pot; the latter, being most suitable as it was light, had least tendency to powder, was reasonably standard material, and was able to retain a fairly large quantity of gum. The standard conditions and apparatus finally adopted are described. Provided the ratio of the quantity of contact material used to the volume of benzole evaporated through the tube was sufficiently large, the amount of gum deposited was found to increase with rise of temperature, and the results were characteristic of the particular sample of motor spirit under test. By testing several petrols, including "cracked" petrols, and also successive fractions obtained from crude benzole by distillation, very interesting results were obtained. These are given in detail and tabulated in convenient form. It was concluded, *inter alia*, that various unsaturated constituents are present in crude benzoles, which differ in their tendency to resinify; and when concentrated into certain fractions, these unsaturateds may be very unstable. There is no linear relation, however, between the amount of resin formed and the concentration of the unstable constituents, though the results in general show that the tendency of benzoles to form gum is roughly proportional to the quantity of unsaturated constituents present.

Preliminary experiments to determine whether it is possible by suitable refining methods (such as sulphuric acid, various adsorbents, &c.) to produce a benzole containing unsaturated bodies which is comparatively stable are given, but no final conclusions are drawn. So far as the work proceeded, however, there was no evidence that the stability of the benzole was improved unless a considerable reduction in the proportion of unsaturateds had taken place.

The next step in the research was the trial of various benzoles as fuel in a motor engine. The engine used was a water-cooled, 4-cylinder, 9·5 H.P., overhead valve "Standard," and three benzoles were tested:

(*a*) A good quality acid-refined benzole.
(*b*) A crude once-run benzole, freshly distilled.
(*c*) An aged, once-run crude benzole.

A continuous run of 100 hours' duration was made; and after each trial the engine was completely dismantled, the various parts were examined and photographed, and the resin and deposits were removed and weighed. Among the useful conclusions drawn from a consideration of the results are:

(1) The gum found on the various parts arose practically entirely from the non-volatile resinous matter already present dissolved in the benzole before use.
(2) Very little, if any, gum was actually formed in the engine by polymerization and oxidation of volatile unsaturated constituents.
(3) Resinous matter sprayed on the cylinder walls may be swept down by the pistons before combustion, and tend to cause thickening of the lubricating oil.

The third section of the report deals with the use of cresol and tetralin (tetrahydronaphthalene) as absorbents for benzole recovery.

After a résumé of the publications on the subject, and also an outline of the theoretical considerations involved, the results of experimental vapour-pressure determinations of cresol and tetralin, and of mixtures of benzene with cresol, tetralin, gas oil, and creosote are given; the dynamic method being used. It was found that the partial pressure of benzene above a benzene-cresol mixture containing 2·8 p.ct. by weight of benzene is more than twice the theoretical partial pressure. Cresol, therefore, in spite of its low molecular weight, is not so good as creosote wash oil for recovery of benzole. On the other hand, tetralin was found to be rather better; but as tetralin itself has a high vapour pressure, the recovery of the tetralin taken up by the gas would probably be necessary.

Part IV. of the report is concerned with colour tests for benzoles, and describes the use of the Saybolt chromometer, the Lovibond tintometer, and the Duboscq colorimeter for this purpose. It would appear that the Lovibond tintometer offers reasonable means of comparison of the brightness and hue of the colours transmitted by different benzoles.

A short appendix dealing with a German modified process for refining crude benzoles with sulphuric acid concludes the report. The process, in brief, consists in adding water or ammonium sulphate liquor to the mixture of benzole and "acid tar" formed on treating crude benzole with concentrated sulphuric acid, and using the acid liquor for ammonia recovery. No opinion is given on the process, but several formidable objections, such as emulsification on adding water, and development of high temperatures with consequent loss of benzole as vapour, will have to be removed before refiners in this country work on these lines.

A very useful bibliography is appended.

The report is to be regarded with interest for two reasons. In the first place the work and reports represent the co-operative researches of the gas industry and Leeds University. The degree of successful effort can be judged by the high quality of the achievements. In the second place, the nature of the work accomplished and the subject matter are of special importance at the present time, because the main aim is to increase, by the application of systematic research, the supplies of benzole motor-spirit made in this country from coal.

"Photometry."—This is the title of a new book by John W. T. Walsh, M.A., M.Sc., &c. It is published by Constable & Co., Ltd., at 40s. net.

Will.—Mr. H. F. W. Harries, Chairman of the Merthyr Gas Company, left estate of the gross value of £32,335, with net personalty £30,850.

WAVERLEY ASSOCIATION OF GAS MANAGERS.

Annual Meeting in Edinburgh, June 25.

The Annual General Meeting of the Association was held in the rooms of Messrs. Ferguson & Forrester, Ltd., 129, Princes Street, Edinburgh. Mr. L. FARQUHAR, of Peebles (the President), occupied the chair; and the attendance was excellent, considering the continuance of the coal strike and the difficulties associated with transport to and from many parts of Scotland.

AN ADVERTISING SCHEME.

The financial statement, duly audited by Mr. John O'Halloran, was presented and accepted by the members. It showed that the financial year closed with £70 on deposit, and a cash balance of £14 6s. 1d. held by the Treasurer.

The PRESIDENT said the Committee had considered how use could be made of their growing surplus; and it had been recommended that a sum of £10 might be earmarked this year for local advertising. There was an idea that some members of the Association were feeling the stress of electrical competition; and if a grant of £10 could be of assistance in counteracting that competition, then it ought to be given.

Mr. J. RICHMOND (Penicuik) thought the recommendation proceeded on right lines; and seeing the funds of the Association were now so substantial, he was prepared to move that this grant of £10 should be made. Something should be attempted to combat electrical competition, which was undoubtedly very severe in many districts throughout the Lothians. Through the activities of the National Gas Council and the British Commercial Gas Association, the larger newspapers were fairly well used for advertising and propaganda; but the money involved in this modest grant would be used in advertising in the local newspapers throughout the Lothians. He moved accordingly.

Mr. R. TAYLOR (Aberlady) seconded.

Mr. R. W. COWIE (Port Glasgow) did not think £10 would go very far in an advertising campaign; and he was disposed to think the grant might be increased to £25 or £30. If an amendment was permissible, and it was felt the money could be spared, he would suggest that the grant be £25.

Mr. J. RICHMOND said that, with the consent of his seconder, he would withdraw the original motion. Certainly, £10 was little enough to spend on local advertising.

The PRESIDENT remarked that the feeling the Committee had was that probably not much benefit would be derived from local advertising in the first year; and it was suggested that the grant might be limited to a sum of £10, to see how the experiment worked out.

Finally it was unanimously agreed to make the grant £25.

NEW PRESIDENT.

The PRESIDENT said the Committee recommended that Mr. J. F. Skea, of Jedburgh, should be nominated as President.

This was heartily endorsed by the meeting; and Mr. SKEA briefly acknowledged the honour done him.

OTHER APPOINTMENTS.

The PRESIDENT thought they could not possibly improve on their present Secretary and Treasurer, Mr. R. J. Philp, of North Berwick. Accordingly, he had pleasure in moving his reappointment, which was agreed to.

To fill two vacancies on the Committee, Mr. Urquhart, of Tranent, and Mr. Blair, of Haddington, were elected.

Mr. John O'Halloran was re-elected Auditor; the PRESIDENT remarking that that gentleman had discharged the duties for the long period of 21 years. At the luncheon which was to follow the annual meeting, he would have something to say about Mr. O'Halloran's fidelity and loyalty to the members.

The usual honorarium was voted to the Secretary and Treasurer.

PRESIDENTIAL ADDRESS.

[See "JOURNAL" for June 30, p. 723.]

The PRESIDENT prefaced his address with a few introductory remarks, in the course of which he observed that since they last met in Edinburgh he had been looking forward to seeing the Association at Peebles, and believed they would have enjoyed themselves in that little town, which possessed a great deal in the way of natural attractions. Owing to the continuance of the coal strike, however, the Committee were faced either with postponing the meeting for an indefinite period or holding it in Edinburgh; and they came to the conclusion that the better plan would be to adhere to the original date. Among those in Peebles who had taken a keen interest in the arrangements for the reception and entertainment of the members had been the late Provost Davidson, who, had he been spared, would have been happy to be among them. By his sudden death last week, he (the President) had lost not only a very helpful Convener, but a staunch friend. He supposed that during the coal strike many of the managers present would be up against the problem of depleted stocks of coal, and some, he believed, had been experimenting with foreign coal. If this were so, it would possibly be helpful if these experiences were discussed at a later stage of the proceedings.

Discussion.

Mr. MCLEOD (Glasgow) said the last paragraph in the address strongly appealed to him, because he supposed he was the only one present who had attended all the meetings of the British Road Tar Association. He could assure them that the Road Tar Association really meant to do good work; and a very determined effort was to be made to meet the competition of those exploiting bitumen. Anything that could be done to extend and maintain the field of usefulness for tar was bound to be good for the whole of the gas industry. To this end it was necessary—as was clearly pointed out in the address—to produce a product as uniform and as constant as they could make it. There was evidence, in the manufacture of tar at Peebles, of great attention to detail. A consistent effort was being made there to secure an absolutely good and useful output of tar. The President said: "On several occasions, also, our tar has been removed from the works while still warm, effecting a saving of time and labour in its application to the roads." That was a very important point; and he (Mr. McLeod) thought it would be advantageous to the gas industry if the application of warm tar could be carried out on a greater scale than at present. It would, of course, be difficult to arrange for the application of warm tar in every area. They must all realize that the tar industry was closely linked up with the manufacture of gas. Great efforts were now being made to produce and manufacture a crude tar containing a minimum of the poisonous agencies responsible for the destruction of fish and vegetable life. If one could be sure that the phenols or crude tar acids would never exceed 5 p.ct., then there would be no fear of such damage. In Peebles the figure was 5'43 p.ct.

Mr. J. RICHMOND (Penicuik) thought the address had been a singularly informative one, especially from the point of view of costs. It made one seriously wonder if it would not be worth while to introduce a dehydrating plant of this description. In the days when tar was dropping in price, his attention had turned more to the utilization of it as a heating agent. On various occasions in the past he had heated a setting of seven retorts successfully with a fine stream of tar. In this way he could meet any reduction in costs that might be required. No doubt it was very tempting to hear of an increased revenue of about 20s. per 100 gallons of tar sold. He had been rather surprised to observe in the President's address the following statement as to holder accommodation: "In mid-winter the effective capacity, with adequate pressure, is only 65,000 c.ft., owing to the deficiency of pressure thrown by the inner lift." It was surely a simple thing, though it might not look too well from an æsthetic point of view, to pile a quantity of scrap iron on the top of that inner lift. Then, at the outset of his contribution Mr. Farquhar was responsible for this statement: "A vigorous campaign resulted in the installation of a large number of cookers and hotplates on the hire system, and later these were given free." Instead of using the word "free," the President might, with advantage and with greater accuracy, have employed a phrase that was very much on their tongues just now. He could simply have said that the cookers and hotplates were given out on a subsidized system.

The PRESIDENT said they were pleased to have information from Mr. McLeod regarding the activities of the Road Tar Association. At present he (the speaker) was working out a scheme, in co-operation with the County Engineer of Peeblesshire, whereby the tar was conveyed in a warm state from the works to the roads in a small tank, which was placed on a motor lorry. In that way any part of the district could be easily reached. In his county he considered they were fortunate in having a County Engineer who was an enthusiast for tar. He depended entirely for the construction of his roads on tar from gas-works, and had done so for many years. As a result, he had admittedly the finest roads in the whole countryside. When he arranged to sell tar to the burgh and county of Peebles, he made the stipulation that authorities would supply and maintain their own barrels. Emphasis had been laid by Mr. McLeod on the necessity for keeping the phenols or crude tar acids at as low a percentage as possible. Just now in Peebles they were endeavouring to run the plant at a slightly higher temperature; and he believed they would be able to reduce the percentage of phenols still further. The tar dehydration plant at Peebles paid for itself in the first year. He appreciated Mr. Richmond's suggestion regarding the inner lift of the holder; but in a residential area like Peebles the Gas Committee had to make certain that nothing was done which would offend the eyes of visitors. He agreed that, after all, cookers and hotplates were not supplied free. They were really subsidized commodities, because the cost had practically to go on to the price of gas. He was not quite clear in his own mind that a free cooker was a paying proposition. It seemed to him that they had now exhausted all the points of interest in the address; and he thought it would be helpful to members if they could have a discussion on the success or otherwise of such foreign coal as had been tried during the present coal strike.

IMPORTED COAL.

Mr. J. JAMIESON (Assistant Gas Engineer, Edinburgh), who was called upon, said that two cargoes of American coal had been ordered by the Gas Department in his city; but the supplies were not due to arrive until July. Samples had been secured; but they had as yet done nothing in the way of serious testing of foreign coal.

Mr. A. KELLOCK (Airdrie) said it might be a matter for wonder why he, situated as he was on the fringe of the Lanarkshire coalfield, should have recourse to foreign coal. Even prior to the strike, the experience in Airdrie had gone to show that the results with the use of Scottish coal had not been all that could be desired. As an experiment, therefore, he had imported 150 tons of coal from Westphalia. This fuel at first sight did not look too promising; but he

had been altogether surprised at the results. It produced excellent coke, well up to the average of the best Scottish coal. The only thing he had to say about the coke was that in the water gas generator it gave them a considerable amount of clinker; but this, fortunately, did not contain much iron. It was more siliceous in condition, and by reason of that was easily scaled off the generator. The analysis of Westphalian coal supplied by the importers gave a volatile content of something like 50 p.ct.; but tests which had been made in this country gave a percentage averaging 26. Through the courtesy of the Glasgow Corporation Gas Department, he had access to an analysis of the foreign coal there. The percentage of volatiles in Glasgow, if he remembered rightly, was also in the region of 26. The calorific value of the gas was 481 B.Th.U.; and the make per ton 11,660 c.ft. The yield of coke came out at between 14 and 15 cwt. Reference had been made by Mr. Jamieson to American coal. Five years ago in Airdrie they had recourse to that. While he was aware that many members of the Association with vertical retort settings had experienced considerable trouble with American coal, in Airdrie, where they had horizontals, they were highly satisfied with it. From his experience of American coal, he would recommend eight hours' carbonizing in horizontals. Those who worked a shorter carbónizing period experienced trouble with choked ascension pipes, &c.; but in Airdrie, where they followed the lines he had recommended, there had been no difficulty whatever. For gas manufacture, Westphalian coal gave no more trouble than ordinary Scottish coal. The consumers of Airdrie must be supplied; and he proposed to continue the use of the imported fuel while the strike lasted. Airdrie would require about 500 tons a month; and the additional cost to the consumer was really only fractional—something like 1d. per 1000 c.ft. spread over a full year. For such a paltry additional cost, he thought the gas industry would be justified in importing Westphalian coal and maintaining their service to consumers.

The PRESIDENT considered Mr. Kellock was sounding the proper note in urging the maintenance of supplies. In his opinion, Airdrie had taken the correct course.

ACKNOWLEDGMENTS.

Mr. R. TAYLOR (Aberlady), immediate Past President, presented Mr. Farquhar with the gold medal of the Association, as a souvenir of his year of office.

Thereafter Mr. COWIE called for a vote of thanks to the retiring President for the admirable and informative address he had given the members.

NEXT YEAR'S MEETING.

It was left to the Committee to arrange the venue for next year's meeting.

LUNCHEON.

Luncheon was presided over by Mr. Farquhar; and in the course of the proceedings Mr. J. O'Halloran was presented with a case of pipes and a copious supply of tobacco, in recognition of his services as Auditor during the past 21 years.

NEW CARBONIZING PLANT AT GOOLE.

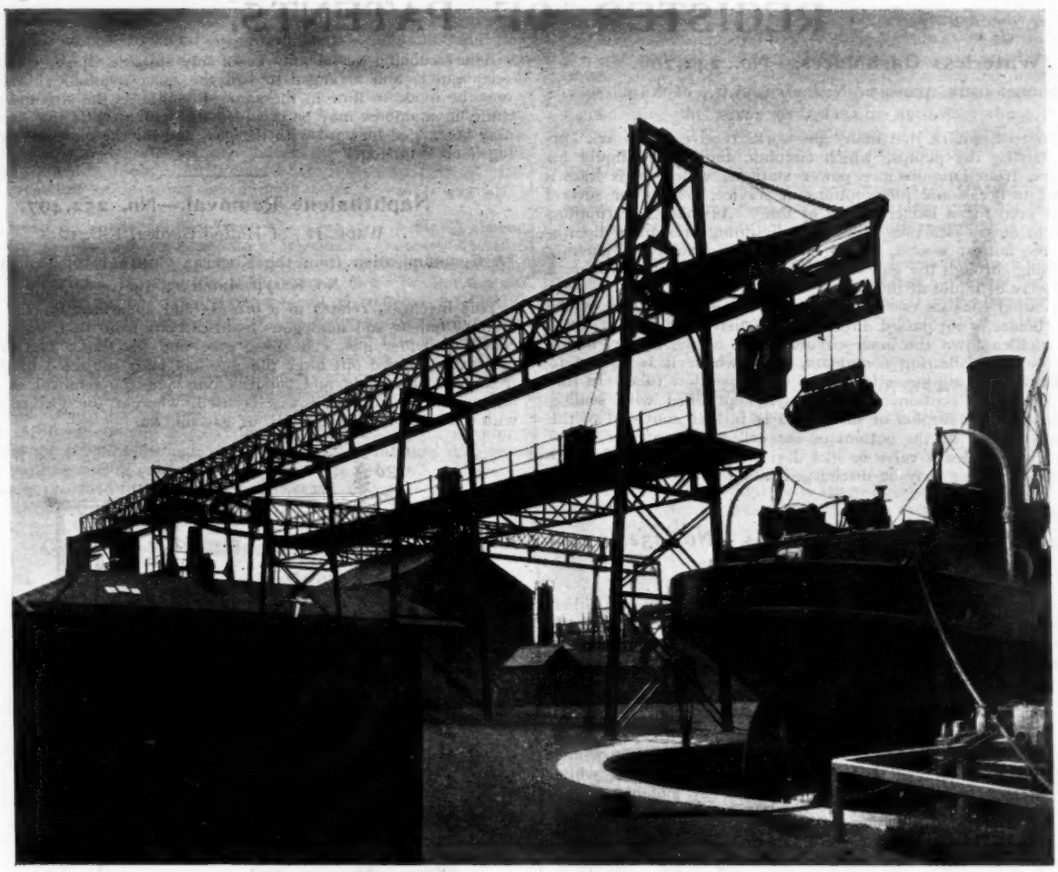
An Installation of Horizontal Retorts.

Further carbonizing plant just erected at the Goole Gas-Works comprises a horizontal retort bench of four arches, each filled with six 24 in. by 18 in. D retorts, 20 ft. long, in three tiers, provided with Drakes' patent tubular regenerator furnaces, furnace fittings, bench bracing, retort mountings, stage floors, and chimney equipped with Drakes' patent chimney-draught regulator. The whole is housed in a steel-framed brick-filled retort house, one end of which is temporarily sheeted to allow for future extensions.

The retorts are charged and discharged by a Drakes' patent combined stoking machine, which is fed from a battery of steel overhead coal storage hoppers, through doors operated from the machine. The overhead hoppers are filled with coal by a drag link conveyor over the hoppers; this conveyor being provided at the outer end with an overhead receiving hopper, which takes the coal from a telpher. The coke is discharged into an electrically propelled coke 'bus, which runs out into the yard on a gantry. The coke is here quenched on a platform, and then is taken away by the telpher.

An electric telpher plant is provided for bringing the coal from barges to the overhead receiving hopper at the end of the drag link conveyor or into store, and also for picking up the coke and taking it to barges or into store. The electrical energy for the coal plant, stoking machine, coke 'bus, and telpher is provided by two new 30 KW. gas-engine driven generating plants. A fully equipped mess room and bath rooms are installed under the stage floor of the retort house.

DISCHARGING SIDE OF THE RETORT HOUSE.



GENERAL ARRANGEMENT OF TELPHER PLANT, SHOWING GRAB OVER DOCK.

The whole of the contract, including the electrical work and foundations throughout, was carried out by Messrs. Drakes, Ltd., constructional gas engineers, of Halifax.

The opening ceremony was accompanied by a luncheon, at which there were a number of congratulatory speeches. In addition to the Chairman of the Council (Mr. C. R. Townend, J.P.), the Chairman of the Gas and Water Committee (Mr. G. Temple), and a good representation of their colleagues, there were present Messrs. T. Thompson and H. Greenwood (of Messrs. Drakes, Ltd.), Mr. A. F. Yates (Gas and Water Engineer), Mr. Buckland (of the F. C. Construction Company, Derby), and others. The opening ceremony was performed by Mr. Temple, and consisted of the discharging and charging of one of the horizontal retorts. Mr. J. E. Dewing (President of the Chamber of Trade), proposing the toast of the Gas Department, said the Chairman of the Gas Committee merited their heartiest congratulations on the consummation of his new gas scheme. The town owed a debt of gratitude to Mr. Temple and to the Gas Manager. Mr. Temple, in reply, declared that the credit for the whole scheme fell to Mr. Yates primarily. An expert consulted by the Council had stated that they could not have better plant than that which Mr. Yates had advised should be installed. The toast of "The Contractors," proposed by Mr. S. G. Bevan (who referred to the satisfactory manner in which the work had been carried out), was replied to by Mr. Thompson, who paid high tribute to the work of Mr. Yates. Mr. J. Kelly, of Bridlington, replied to the toast of "The Visitors," and congratulated the Council on the acquisition of a gas plant admirably suited to the town's requirements. Mr. Yates's health was drunk at the call of Mr. Temple, who said that Goole was fortunate to have the services of such an official at a critical period in its history; and Mr. Yates, in his reply, remarked that the credit was really due to the staff, for their loyalty and help.

Poppy Day Report, 1925.—We have received a copy of the report of Earl Haig's British Legion Appeal Fund for 1925. It is highly satisfactory to note that the public responded to the claims of Remembrance Day so whole-heartedly that a grand total of no less than £392,000 was raised on Nov. 11, 1925. In 1924 the amount was £350,000. To Englishmen and women of all shades of opinion and of every social degree, the facts and figures presented in the report must be a source of pride; they describe in plain terms the story of a great national endeavour to honour a great national obligation.

Forthcoming Chemical Industry Exhibition.—Mention has already been made in the "JOURNAL" of the exhibition being organized by the Manchester Section of the Society of Chemical Industry, supported by the Fuel Section, the Coke Oven Managers' Association, the Institution of Gas Engineers, and other bodies, under the title of the National Coal Products, Chemical, and Engineering Exhibition. The wide scope afforded will include all branches of coal and tar products, dyes and colours, fuels and heavy oils, industrial and fine chemicals, instruments, plant for the purification, carbonization, and treatment of coal, and also chemical engineering plant of all types. The Exhibition will be held in the City Hall, Deansgate, Manchester, and will be open from Nov. 16 to 27. Firms requiring particulars of available space, tariff, &c., are invited to apply direct to the organizers—Provincial Exhibitions, Ltd., City Hall, Manchester.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Gas Making Vagaries.

SIR,—Why do we only get 60 to 80 therms from a ton of coal, when it is possible to get 100 to 200? Why do we persistently ignore science, by forcing heat through two non-conductors—*i.e.*, fireclay and coal? Why do we only use two, or at most three, fuels for gas making—*i.e.*, coal, coke, and "Solar" oil, when it can be profitably produced from over a hundred materials? Why do therms cost 2d. to 4d. to produce, when they can be obtained at from 1d. to 2d.? Why do we expend on town gas making plant 50 to 100 p.ct. more than is necessary?

The above discrepancies are remarkable, and unlooked for, considering the exceptionally high intelligence in the gas industry. No wonder low-temperature carbonization is a white elephant, instead of being a possible gold mine. The matters touched upon in this letter are of supreme importance, when it can be taken for granted that coal will be dearer in the future. Now, if it is possible to achieve the points outlined—which I contend it is—then the present and future coal disputes can be treated with the greatest indifference, not only by the gas industry, but by the community.

CHEMICAL ENGINEER.

July 1, 1926.

REGISTER OF PATENTS.

Waterless Gasholders.—No. 242,260.

MASCHINENFABRIK AUGSBURG-NURNBERG, A.G., of Nürnberg.

No. 26,103; Oct. 19, 1925.

The patentees remark that many gas-works receive the electric current for driving the pumps, which circulate the sealing liquid for dry holders, from long-distance power stations, which as is known are subject to occasional interruptions of service, lasting for several hours and even for a longer period of time. As these interruptions of service in most cases take place after lightning or similar disturbances in the hottest season, during which the quantity of packing liquid passing through the gap is largest, it is desirable to provide a certain reserve of liquid at the top of the holder.

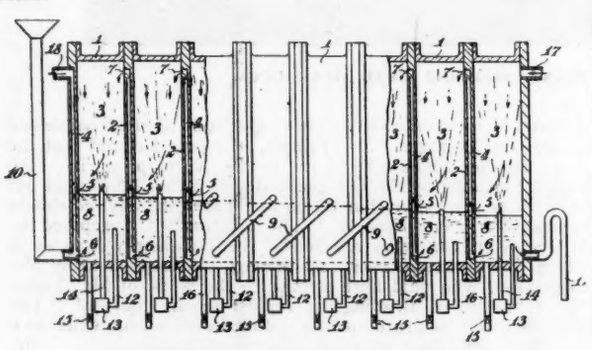
The invention consists essentially in that the sealing liquid at the top of the holder is not passed directly to the distributing boxes, from which it trickles down the inner circumference of the holder, but is first conveyed to collecting containers, from which it is caused to flow to the distributing boxes by means of an overflow tube. In this way the collecting containers are always kept filled with sealing liquid, and only the surplus of this liquid is further conveyed to the distributing boxes. At the bottom of the collecting container, however, there is provided a valve or like device through which the contents of the container may be discharged into the distributing boxes whenever necessary.

Washing or Scrubbing Coal Gas.—No. 252,867.

BLAKE, T. V., of Cardiff.

No. 12,341; May 12, 1925.

This invention relates to washing or scrubbing coal gas or other gas of similar chemical composition. The process eliminates all moving machinery and appliances, and causes the gas to traverse a number of compartments in a casing and to encounter successively in its travel a number of sprays of washing liquid, which is forced into the several compartments. The washing liquid, which may be oil, water, or a chemical solution, falls back, carrying with it the ammonia and other gaseous constituents and impurities extracted from the gas, into the bottom of the casing, from which the whole or part of it is again forced in spray into the compartments, while the tarry matters and sediment are drained off by slidable sludge cocks.



A Non-Mechanical Scrubber.—T. V. Blake.

We reproduce a part-sectional side view of one form of scrubber. According to the invention, the horizontal cylindrical casing is made in sections 1 with vertical hollow dividing plates 2 between the sections secured by bolts through the flanges of the sections and peripheral edges of the plates. Each dividing plate 2 has internal passages 4 with inlet holes or slots 5 for gas above the liquid level, outlets 6 in one compartment, and outlets 7 for gas at or near the top in the next compartment. Receptacles 8 for the gas-washing liquid at the bottom of each compartment communicate with the next compartment by ports and pipes 9 from the bottom of one receptacle to a point at or just above the level of liquid in the next compartment, whereby a step-by-step reduction of level of liquid in the receptacles 7 takes place from the compartment where the liquid is introduced into the casing by a funnel and pipe 10 to the compartment at the other end of the casing where a syphon overflow 11 is fitted. There are suction pipes 12 to pumps 13, and delivery pipes 14 to discharge the sprayed liquid into the gas. Sludge cocks 15 are fitted to pipes 16 at the bottom of receptacles, whereby tar and sediment can be drained off.

The gas enters by an inlet 17 at the end compartment, meets a stream of spray, and, as shown by arrows in the drawing, passes downwards against the stream to the inlet holes or slots 5 in the dividing plate, passes up the passages 4 therein towards the top, and emerges from the plate by outlet holes or slots 7 into the next compartment, where it meets another stream of spray. Any spray, tarry matter, or sediment entrained with the gas as it flows up passages 4 in the dividing plates 2, falls back and drains through the draining outlets 6 into the receptacles 8. The gas traverses each compartment in a similar manner until it reaches outlet 18.

The bulk of the washing liquid need not be contained in the casing, but may be accommodated in a separate tank from which the pumps could draw their supply of liquid. The overflow from the last compartment would pass into the tank, which may also be made in several compartments corresponding to those in the casing and containing liquid of different degrees of concentration. Such an arrangement is also illustrated in the specification.

The scrubbing vessel may be of any suitable shape, cylindrical or rectangular, and arranged to suit the space available; and the gas may be made to flow in the same direction as the streams of spray. Suitable chambers may be provided for dealing with any spray which may be carried forward with the gas, and for the extraction of "gas-fog" or "tar-fog."

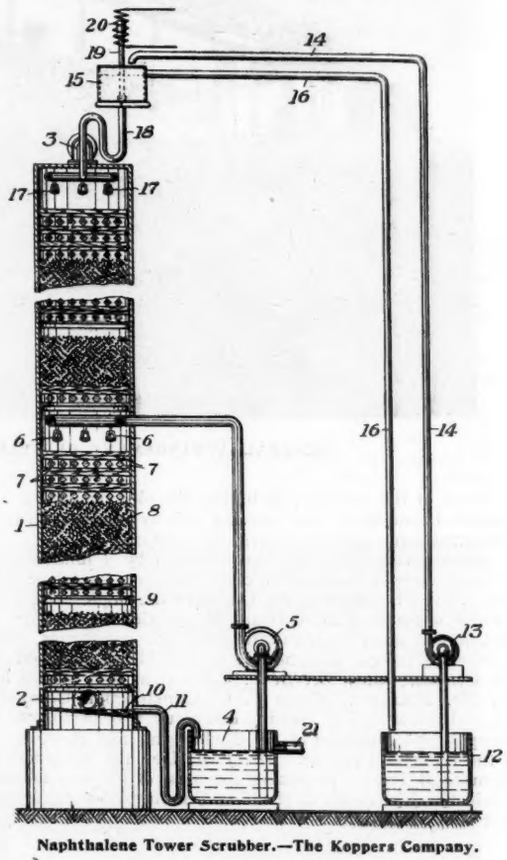
Naphthalene Removal.—No. 252,497.

WADE, H., of Hatton Garden, E.C. 1.

[A Communication from the KOPPERS COMPANY, of Pennsylvania.]

No. 8009; March 25, 1925.

This invention relates to a process and apparatus for the removal of naphthalene and analogous hydrocarbons from fuel gases, such as coal gas, water gas, coke oven gas, and the like. The process is preferably carried out after the gas has been subjected to the usual treatment of cooling and condensation and the removal of tar and ammonia. A form of tower is used, wherein the gas is scrubbed with kerosene, anthracene oil, or gas oil, &c.



Naphthalene Tower Scrubber.—The Koppers Company.

In reference to the diagram, it is explained that the shell 1 is provided with a gas inlet pipe 2 at the bottom and a gas outlet pipe 3 at the top. As the gas passes upwardly it comes in contact with a suitable naphthalene solvent such as one of the oils above referred to. This solvent is supplied from a tank 4 by a pump 5 which discharges the solvent through spray nozzles 6. The solvent falls and comes in contact with diamond hurdles 7, which ensure uniform distribution of the solvent over the entire tower. These hurdles are made of wooden staves usually about 1 in. square laid in rows; and each bank may be constructed of some 5 to 10 layers, although when they are used merely as supports for the intermediate banks of steel turnings a smaller number of layers may be used.

These steel turnings are preferably in the form of spirals not exceeding 1 in. in diameter and about 12 in. long; and it is desirable to limit the depth of each bank to approximately 4 or 5 ft.

The solvent moves downwardly through the hurdles and steel turnings until it reaches the bottom of the tower, is collected at 10, passes through a trapped pipe 11, and goes to the tank 4 for recirculation.

By this means, the naphthalene is removed to such an extent that a final spray will remove the remainder—at the spray nozzles 6 it should not contain more than 15 to 30 gr. of naphthalene per 100 c.ft., depending on the amount of original naphthalene. In fact, if the gas originally supplied to the apparatus contains naphthalene in quantities less than 15 gr. per 100 c.ft., the lower absorption stage may be done away with entirely, and the last stage alone relied on.

The upper portion of the tower is constructed just like the lower portion; but it is necessary in this upper stage to bring the gas into contact with fresh solvent containing no naphthalene or only a very

small amount thereof—for example, the vapour tension of such a solvent with respect to naphthalene will be less than the equivalent of 2 to 3 gr. of naphthalene per 100 c.ft. of gas. It is always preferable to employ a perfectly fresh solvent such as kerosene or gas oil which contains no naphthalene at all. Further, since the amount of naphthalene to be removed in this stage of scrubbing is very small, the amount of oil required is also very small, and the principal problem is to obtain an efficient distribution of this small quantity of oil over the tower filling. In order to accomplish this, use is made of the principle of injecting oil at high rates for short periods of time.

The fresh solvent is supplied from a tank 12 by a pump 13 through a conduit 14 which discharges into a container 15 above the tower. A return pipe 16 is provided, and the rate of supply by the pump 13 is such that there is always a slight return flow through the conduit 16, thus ensuring the maintenance of a constant level in the container 15. The latter is connected to spray nozzles 17 through a trapped conduit 18. A valve 19 is provided, and this is operated at timed intervals in accordance with the amount of solvent it is desired to inject. This injecting step is preferably accomplished several times each hour, and it may be readily done by an electro magnet 20 connected to any desired time control.

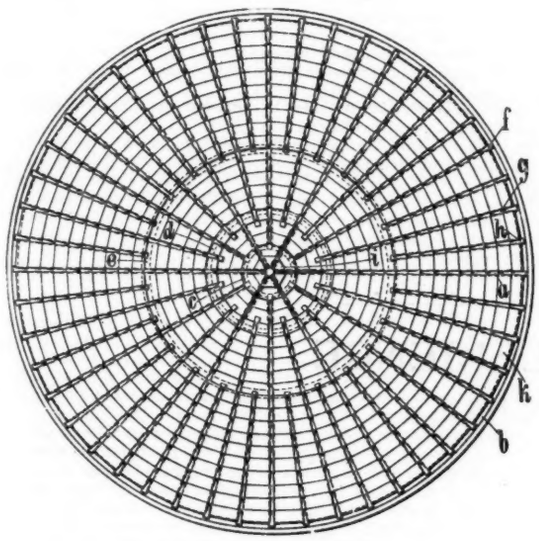
The oil from the upper part flows right through and is mingled with the oil supplied through the sprays 6. The mixture then passes to the tank 4 and is re-circulated through the spray 6. An overflow pipe 21 is provided for taking off the excess.

Crowns of Gasholders.—No. 252,936.

REESON, J. N., of Melbourne.

No. 19,629; Aug. 4, 1925.

It is the object of this invention to provide a form of gasholder crown construction convenient for the application of arc welding. Accordingly, the crown is built up of plates or straps of metal extending generally in a radial direction from a central cap or ring to a curb at the circumference of the crown, with intermediate rings, if required, from which intermediate radiating plates or straps can extend outwardly; the gaps between the radiating straps being then filled in with sections of sheeting welded to one another and to the plates. In erecting the crown, these radiating plates or straps may be laid upon a framework of timber or metal such as is generally used to support the weight of the structure when not lifted by gas pressure. The straps are thus given any initial curvature or doming that may be required.



Welded Gasholder Crown.—J. N. Reeson.

In the plan which we reproduce, *a* are the principal radiating plates or straps, six of which are shown in this case, extending from the centre to the curb *b*. In the example given, there are three internal intermediate circumferential rings at *c*, *d*, and *e*, as indicated in dotted lines; there are six intermediate radiating straps *f*, extending from the inner ring *c*; there are twelve additional radiating straps *g* extending from the next ring *d*; and twenty-four additional intermediate straps *h* extending from the ring *e* to the circumference. Such construction is convenient in order to give adequate support to the sheeting and to avoid the necessity for using unduly long strips of sheeting; but it is not essential, for example, to use the last set of straps *h*, as longer sections of sheeting might be used to bridge the space between the straps *a* and *g*, *g* and *f*, and so forth.

In the plan, the sheeting is shown as being all composed of sections *k* with straight sides, and with the ends only cut at an angle where required to fit between the straps. This is necessary for the plates forming the central cap *i*, which extends over the innermost ring *c*. Two further rings of sections of sheeting are shown with their ends cut at an angle extending out nearly to the ring *d*; but after this all the sections of sheeting are shown as being rectangular, their ends overlapping the radial straps *a*, *f*, *g*, *h*, to which they are welded. All the sections of sheeting may have their ends cut at an angle if preferred; but it is not essential, and a substantial economy is effected by using rectangular plates as far as possible.

In the building of the structure, the central cap *i* and the extensions of the radial straps *a* over the same may be omitted in order to leave room next the ring *c* for a crane to be supported which may be used for handling the plates and sheeting until everything is completed except the central cap. The sheeting of the central cap is then applied, and the radiating plates *a* are extended to the centre and welded together finally as shown.

In a smaller structure the outer edges of the outermost sections of the sheeting may need cutting or curving somewhat so as to avoid the circumferential curb; but that is not required in a large crown such as is shown in the plan.

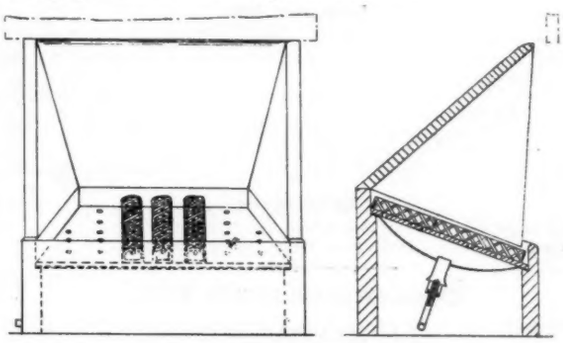
The straps, *a*, *f*, *g*, and *h* need not necessarily be placed in a truly radial position, although such is preferred. Further, sections of the sheeting in the straps between the radial plates are not necessarily at right angles to a radial line bisecting the angle between a pair of these straps.

Gas Fires.—No. 252,897.

MULHOLLAND, J., of Whitley Bay.

No. 14,402; June 2, 1925.

This invention relates to incandescence gas fires of the kind provided with a horizontal or rearwardly inclined hearth set as a small angle (say, not exceeding 40° to the horizontal), and with rearwardly converging sides and a low straight or bowed front.



Mulholland's Gas-Fire.

From the reproduced drawings of one form of the invention, it will be seen that the back of the fire is continuously forwardly and upwardly inclined or curved so that its upper edge lies vertically, or almost so, over the front edge of the hearth. The latter comprises a perforated plate forming the cover of a chamber wherein air and gas for combustion are mixed and preheated; and the hearth supports a series of tubular incandescent elements laid thereon and raised to incandescence by jets of mixture passing through the perforations.

The front, back, and sides of the fire are cast in fireclay, glazed earthenware, or other suitable substance, and the front and lower portions of the back and sides are preferably separate from the upper portions of the back and sides, which are supported thereby and, if desired, attached thereto. The hearth may be of fireclay or of metal, and is supported by the front and the lower portions of the back and sides, which together form a frame.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for June 23.]

Nos. 14,868-15,527.

BEAN, O. U.—"Production of gas." No. 14,870.
BRADY, E. J.—"Purification of gas." No. 15,396.
DRAKE, J. W.—"Apparatus for receiving coke from gas retorts." No. 15,117.
ENGSTFELD, H.—"Gas meters." No. 15,057.
GASWERKSBAU-UND-MASCHINENFABRIK AKT.-GES. F. MANOSCHEK.—See Engstfeld, H. No. 15,057.
HALDEN, C. AB-DER-.—"Distillation of tar, &c." No. 15,432.
HARRISSON, F. J.—See Drake, J. W. No. 15,117.
HUMPHREYS & GLASGOW, LTD.—See Brady, E. J. No. 15,396.
MEIRO, A.—"Extraction of crystals from anthracene, naphthalene, &c." No. 15,075.
MEIRO, A.—"Distillation of coal tar." No. 15,076.
SALERNI, E. M.—"Distillation of carbonaceous materials, &c." No. 15,201.
SALERNI, E. M.—"Gas washers, purifiers, &c." No. 15,202.
SALERNI, E. M.—"Apparatus for treating gases, liquids, &c." No. 15,203.
WEST F. J. & K., and WEST'S GAS IMPROVEMENT COMPANY, LTD.—"Vertical retort settings." No. 15,421.
WIATT, J. P.—"Gas stoves, &c." No. 15,019.

[Extracted from the "Official Journal" for June 30.]

Nos. 15,528-16,175.

ABFOTT, A. V.—"Low-temperature distillation retort." No. 16,162.
AIRD, K.—"Grill burners of gas stoves." No. 15,684.
HUSBAND, E. B.—"Burners for gas ovens." No. 15,771.
MAIN, LTD., R. & A.—See Aird, K. No. 15,684.
PINTSCH AKT.-GES., J.—"Gas meters." No. 15,835.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

Barnet District Gas and Water Bill: Read the third time, and passed.

Gas Light and Coke Company's Bill and Swindon Corporation Bill: Read the first time, and referred to the Examiners.

Halifax Corporation Bill: Returned from the Commons with amendments; the amendments considered and agreed to.

Mynyddislwyn Urban District Council Bill: Reported, with amendments.

Royal Assent.

The Halifax Corporation Bill received the Royal Assent.

Special Orders.

Birkenhead Gas Order and Haslemere and District Gas Order: Referred to the Special Orders Committee.

Ellesmere Gas Order, Liverpool Gas Order, and Seaford Gas Order: Report from the Special Orders Committee that no petition had been presented praying to be heard against these Orders, and that there was nothing in them to which they thought it necessary to call the attention of the House.

HOUSE OF COMMONS.

Progress of Bills.

Barnet District Gas and Water Bill and London County Council (General Powers) Bill: Read the first time, and referred to the Examiners.

Chorley Corporation Bill: Reported, with amendments, from the Local Legislation Committee.

Gas Light and Coke Company's Bill and Swindon Corporation Bill: Read the third time, and passed.

Halifax Corporation Bill: Read the third time, and passed, with amendments.

Special Orders.

Clitheroe Gas Order: Approved.

Haslemere and District Gas Order: Copy presented.

CHORLEY CORPORATION BILL.

This Bill was last week considered by Section B of the Local Legislation Committee of the House of Commons (presided over by Mr. W. Raine). There are a number of clauses relating to the gas undertaking of the Corporation (see "Journal" for Jan. 20, p. 161).

Mr. F. N. Keen (for the Corporation) said that the clause defining the limits of supply for gas was inserted because the area of one of the parishes supplied had been altered since that parish was originally included in the gas limits.

Mr. *Mark Newsome* (Gas Engineer and Manager to the Corporation) pointed out that the clause did not involve an extension of the limits of supply.

There is a clause in the Bill giving the Corporation power to purchase residual products from other gas undertakings, up to the usual limit of one-third the amount of the like residual products which the Corporation themselves produce.

Mr. *Newsome* said there were some small works in the neighbourhood of Chorley from which the Corporation might be able to acquire residual products and convert them more advantageously than the small works referred to could do. He mentioned three small works, producing 12,000,000, 18,000,000, and 16,000,000 c.ft. of gas per annum respectively, the production at Chorley being 247,000,000 c.ft. The ammoniacal liquor produced at the first of these works, at Blackrod, during the war was wasted, owing to the high cost of carriage. The chemical manufacturers would not take the product, and the works were not of sufficient size to warrant the provision of sulphate of ammonia plant. The works were situated 4 miles from Chorley; and the Corporation possessed motor transport, so that it would be an economical proposition for the Blackrod Works to sell their residuals, and at the same time the Chorley Corporation would benefit because the plant would be more fully occupied. He did not wish to go into the general chemical business—indeed, the clause prevented him from so doing.

There was a little discussion on the clause giving the Corporation power to compel the repair of piping and appliances in a dangerous condition. [Railway companies' property, other than dwelling-houses, is excluded from the operation of this clause.] In a report to the Committee, the Board of Trade said there appeared to be some doubt as to the power of the Corporation to enter premises for the purpose of the inspection contemplated by the clause, and the Board were inclined to think that if the clause were allowed it should contain power to enter premises for this purpose. Consequently, power of entry was inserted. It was also suggested by the Board that there should be provided a right of appeal against a decision by the Corporation to cut off the supply of gas in cases where repairs have not been carried out. The view of the Corporation was that such a provision would be inappropriate, because it would to a large extent destroy the benefit of the clause. If, for instance, the premises in question were a flat, such a provision might affect the property and lives of the people above. It was essential, where the clause needed to be operated, that it should be operated immediately; if there were delay pending appeal, the danger against which the Corporation sought to insure might actually occur meanwhile.

The Chairman said the Committee did not wish the clause to be acted upon harshly.

Mr. *Newsome* undertook that it should not be.

The Committee allowed the clause.

Another clause discussed was one giving the Corporation power to provide showrooms and offices, and to exhibit specimen installations, machinery, fittings, and other apparatus, appliances, articles, and things "used in connection with the manufacture and consumption of gas and resulting from the manufacture of gas."

Mr. *Newsome* said he wanted to be able to exhibit such appliances, for example, as dehydrating plant, or the product from it and from the sulphate of ammonia plant, &c., because it was his idea to encourage the use of residuals.

The Bill also included a clause to empower the Corporation to give or receive bulk supplies of gas.

Mr. *Newsome* said there were five collieries in the area of supply, and, as the result of possible developments in the coal industry, they might decide to adopt coke ovens, and would be desirous of disposing of their surplus illuminating gas to the Chorley Corporation.

The Committee approved of these clauses, as well as those in another part of the Bill dealing with the sale of coke, to which there was no alteration.

LEGAL INTELLIGENCE.

HELPS v. OLDHAM CORPORATION.

Tuesday, June 29.

Counsel for the defendants handed in an amendment to the particulars of defence given under an Order of May 8. It related to the use of the apparatus with coal, and said: "The design of the superheaters and the design and size of the mains which form part of the plant are defective, and give rise to the deposits of tar and liquor which block the said mains and render it impossible to work the plant commercially and continuously."

Mr. Whitehead said he would not answer that no proper attempt was made to work the plant on coal. Instead, he declared the defendants had succeeded in working the plant from a commercial point of view on coal. Of course, the plant was new and experimental, and it was open to Mr. Helps to take steps to prevent the accumulation of tar; and he was engaged in taking those steps at the time of the experiment. A witness for the defence had mentioned that it was possible to get gas of 180 B.Th.U. when working Mr. Helps's plant on coal, and Counsel contended that was inconsistent with the defendants' conclusion that the apparatus worked as a producer plant. The use of steam for cleansing in town gas practice obtained elsewhere, and the defendants should have been allowed to have steam and liquor, as they desired to avert stoppage. It had been conceded by the defendants that the plant would yield 20 million B.Th.U. per ton of coal running on coal; and the guarantee was 15 millions. But defendants said it did not do this economically. He did not suggest that certain paragraphs were novel in the plaintiff's particulars, but he did say that they were all useful. Indeed, defendants' witnesses agreed as to the utility of what was disclosed. His real point was whether there had been that total failure which the defendants implied. To his mind, there had been no such failure.

His Lordship: Assuming you fail on the licence, you will go back to the prior agreement; and then you have to show that the defendants have used it.

Counsel claimed that service depended on the quality of the mixture of gas and air which produced the flame, and on the method of applying the flame. He said that low-grade gas adequate in quantity for consumers' use could be effectively distributed through the same mains, at the initial works pressure, wherein high-grade gas was usually distributed; that, if gas was burnt with substantially coneless flames and with proper flame contact, as could be done by the use of burners and hotplates of the plaintiff's invention, considerable economy in consumption was effected.

The two concluding speeches lasted eight days, each of them four days; and the Judge, on the conclusion of the hearing, complimented Mr. Whitehead on the clearness with which he had made his points.

Judgment was then reserved, the hearing having lasted 25 days.

Ex-Gas Manager Sentenced.

After lasting four days, the trial of William Murray Cumming (aged about 40), on charges of embezzlement while Manager of the Dunblane Gas Company, Ltd., was concluded in Dunblane Sheriff Court on Saturday evening, June 26, when the accused was found guilty, and sentenced to six months' imprisonment. No fewer than 142 witnesses were heard; and the amount involved in three charges was £477. Accused stated that he joined the Dunblane Gas Company as Assistant Manager in April, 1919, and later became Manager. His salary as Manager was £225 a year, with an annual bonus. He suggested that money was stolen from an unlocked desk in the meter house, the door of which was also open. He denied that he went round collecting money from slot meters shortly before his dismissal, because he was pressed for money in connection with litigation. On his behalf, Counsel maintained that there was absolute slackness in the method of book-keeping at the works; and the Sheriff agreed that the system was one that lent itself to fraud.

MISCELLANEOUS NEWS.

SOUTH SUBURBAN COMPANY'S STANDARD PRICE.

Report of the Public Control Committee of the London County Council.

It may be recalled that twelve months ago the London County Council decided to apply to the Board of Trade, under the Gas Regulation Act, for an Amending Order reducing the standard price applicable to the South Suburban Gas Company; and as a result of the Council's application a public inquiry was begun by the Board of Trade in November. The inquiry was adjourned on the application of the Company, in order to enable them to decide whether they would promote a Bill in Parliament dealing with the question of standard price, or whether they would apply to the Board of Trade for a Special Order. The Company decided to take the latter course, and submitted a draft Special Order for approval by the Board. The Council then decided to oppose the application for the Special Order, chiefly on the grounds that the conditions prevailing did not justify so high a standard price as that proposed—namely, 13d. a therm—and that it was undesirable that the new standard price should, as contemplated by the draft Special Order, remain in force until Jan. 1, 1931, thus relieving the Company until that date from applications by local authorities for reduction of standard price, which can be made under the Gas Regulation Act at any time. A public inquiry was in due course held by Mr. J. F. Ronca (Director of Gas Administration) into the Company's application for a Special Order, at the same time taking into account the Council's adjourned application for an Amending Order.

According to a report of the Public Control Committee to the London County Council, at the opening of the proceedings preliminary objection was taken on behalf of the Council as regards the powers of the Board of Trade to make a Special Order under section 10 of the Gas Regulation Act fixing a new standard price of gas. The Director decided that the inquiry should continue, subject to his examination later of the point raised as to the jurisdiction of the Board. In opening the case, Counsel for the Company stated that in their application the Company had asked for a new standard price of 13d. a therm in lieu of the existing standard price of 15d., but that, in view of favourable coal contracts which they had been able to secure, they were able to reduce the standard price asked for to 12·4d. a therm. He also stated that the Company were prepared to agree to the amendment sought by the Council and other local authorities to the effect that any application for a revision of the new standard price to be fixed might be made at any time instead of being prohibited for a period of five years. Evidence was given on behalf of the Council by Mr. Arthur Valon, who acted in consultation with the Council's officers. It was submitted on behalf of the Council that the new standard price should be fixed at 11·4d., instead of 12·4d. a therm.

The Committee's report continues: The Board of Trade have now prepared a draft Special Order, in which the revised standard price fixed is 10·8d. a therm, but this is coupled with an increase of the standard rate of dividend by 11s. 8d. p.ct. for each half-year—*i.e.*, from £5 p.ct. to £6 3s. 4d. p.ct. per annum. These provisions would allow the payment of the same dividends as if the standard dividend of 5 p.ct. had been retained, and the revised standard price had been fixed at 12·2d. a therm. The form of the draft Order, however, brings the figures of the standard dividend and standard price into more direct relation with the existing facts as to dividends and costs. The clause in the draft Special Order submitted by the Company preventing the revision of the standard price until after Jan. 1, 1931, has been omitted, and the revision of this price remains subject to the provisions of section 1 (3) of the Gas Regulation Act.

At the inquiry the Council contended that a reasonable rate of dividend to be allowed for in the standard price would be 6 p.ct., while the Company asked for 6¼ p.ct. At the present price of gas (11d. a therm) the dividend payable, under the provisions of the draft Special Order, would be 6 p.ct. The dividend paid by the Company for the last two years has been £6 10s. p.ct. (which was considerably less than the dividend authorized under the sliding-scale then in force). The Order, if confirmed, will therefore offer a strong inducement to the Company to reduce the price charged for gas.

Both standard price and the addition allowed to the standard rate of dividend will, in future, be subject to revision, instead of only the standard price. Although, however, it is proposed, by clause 5 of the draft Special Order, to authorize local authorities to apply, in five years' time, for a reduction of the increased rate of dividend allowed by the draft Order, the grounds on which such an application may be made were not stated in the draft Order. It appeared to the Public Control Committee desirable that this should be stated therein; and they accordingly made representations to the Board of Trade on this point. The Board intimated, however, that they were not prepared to comply with the suggestion, as they desired to leave it open to the local authority to submit for the consideration of the Board any evidence tending to show that a reduction of the increased rate of dividend should be made.

CO-OPERATION IN THE HOUSEHOLD APPLIANCES INDUSTRY.

A New Section of the London Chamber of Commerce.

There was a successful first general meeting, at the Holborn Restaurant, on Monday, June 28, of the Household Appliances Section of the London Chamber of Commerce; the proceedings taking the form of a luncheon (at which about fifty sat down), followed by an address by Mr. F. W. Goodenough, C.B.E.

OBJECTS AND METHODS.

When announcing the formation of the new Section in the pages of the "JOURNAL" a fortnight ago, mention was made of the factors which have caused inventors and manufacturers to turn their intention in ever-increasing degree to the need for efficient and labour-saving devices in household management. The capital and labour now employed in the production and distribution of these goods are considerable; and many interests are shared in common by those who are engaged in the industry. The modern tendency to deal collectively with common problems has led a number of prominent firms to come into closer relationship; and the machinery for co-operation has been found within the organization of the London Chamber of Commerce, who place at the disposal of the Section meeting rooms and secretarial staff. The Section is also entitled to be represented on the Council of the Chamber, and can thereby secure the support of the largest trade organizations in the country.

There are, of course, many things which can be accomplished by an organization of such a character; but, to put the matter briefly, the Section has been formed to provide machinery for co-ordinating the activities of the industry as a whole; to secure it from waste or exploitation; to co-ordinate and develop the education of public opinion at present being carried out spasmodically; and to provide a means of influencing public or private bodies whose attitude is often of vital importance to the industry as a whole. There are in view, among other things, co-operative national advertising; selling campaigns in groups; elimination of unsound sales methods; protection against the introduction of appliances making false claims; and negotiation with exhibition promoters.

A SOCIAL REVOLUTION.

Sir STEPHEN DEMETRIADI (Chairman of the Council of the Chamber) presided, and remarked that the new Section held out promise of an active and useful career. The amazing progress which had taken place in the practical application of scientific discoveries and inventions during the past quarter-of-a-century had completely revolutionized industrial and commercial methods. It was, however, only within the last few years that real prominence had been given to the importance of devising ways and means of running the nation's homes with efficient labour-saving devices. The social revolution which had taken place during the last decade, and which had led, among other things, to what was known as "the servant problem," had made the further development of the industry in which those present were interested acutely urgent. Women were demanding a fuller and freer life, and at the same time the hygienic standard of the nation had been considerably raised. One of the aims of the Section would be to restrict membership to those manufacturers and merchants who had a *bona fide* household appliance of a labour-saving character to offer to the public, and to protect the public against spurious and undesirable articles. They were to have an address from Mr. Goodenough (Controller of Gas Sales of the Gas Light and Coke Company, and Executive Chairman of the British Commercial Gas Association), to whose organizing ability was largely due the tremendous success of the gas exhibit at the British Empire Exhibition.

ADVANTAGES OF CO-OPERATION.

Mr. F. W. GOODENOUGH said he had been asked to address those present on "The Advantages of Co-Operation in the Household Appliances Industry." The world was in more need to-day of the spirit of co-operation than it had ever been before; and it was because this Section was founded on the spirit of co-operation in public service that he was glad to be associated with it, and proud to be asked to speak at the first meeting. He had for some fourteen years been working as Chairman of an Association which was based entirely on the principle of co-operation in public service; and he could say, from his experience of the British Commercial Gas Association, that co-operation was undoubtedly of the very greatest benefit to all those who took an active part in it. The more willing one was to co-operate for the sake of mutual service, the more benefit one derived from co-operation. The members of the Section would justly feel that they were co-operating in a worthy object. Mention had been made by the Chairman of the work that the industry of making household appliances was doing. It was sometimes forgotten that the "profession of home-keeping" was the one in which the largest number of people were employed; and if the Section could do something to lessen labour and increase leisure further in the homes of the country, they would not have come together in vain.

Reference had been made by the Chairman to the possibility of the Section being active and useful. If they were not going to be active, they could not be useful; and if they were not going to be useful, the sooner they disbanded themselves the better. Among the aims of the Section two things struck him as being of the utmost importance. First of all there was the protection of the public from

appliances on behalf of which false claims were advanced. Those in the gas industry had no small experience of this trouble; and if the Section could be of assistance to them, by co-operation, in eliminating from the market as far as possible appliances the claims for which were not justified, very good work would be done, not only in the protection of the public pocket, but in increasing public safety. There were some rubbishy appliances for the use of gas put upon the market, which were not only extravagant in gas consumption, but were dangerous; and he could promise the Section, on behalf of the gas industry, that the co-operation of the members in the elimination of these undesirable appliances would be greatly welcomed. On first thoughts, they might consider it strange for him to wish to eliminate appliances that were extravagant in gas consumption; but on reflection it would be generally realized that an extravagant appliance was the worst enemy, rather than the friend, of those who had to sell gas. It was the economical appliance, which gave satisfaction to the consumer, that ultimately brought in more orders, and sold more gas. The second point that particularly appealed to him among the objects of the Section was the elimination of unsound sales methods. If through the Section they could do anything to raise the standard of salesmanship in their business dealings, they would greatly benefit themselves, as well as the public.

Had the true spirit of co-operation been working in the coal industry, the country would not to-day be undergoing its present trying experience. The Chairman was one of those who were most active; and he believed he would be most successful in bringing about the necessary co-operation between owners and men which it was hoped before long would make an end to this troublous condition of affairs. The true basis of business was goodwill; and goodwill could only be brought about by considering the other man's point of view, and meeting it in every possible way. The members of the Section could derive the greatest benefit by being always willing to pool all their experiences, all their ideas, and all their brains, with a view to improving the general prospects of the household appliances trade. They must co-operate in fact, as well as in word; and he could express, for himself and the industry he represented, willingness to do all that was possible in this way. He was sure they would benefit materially by co-operation with the other members of the Section. A good beginning had been made; and he hoped the Section would grow steadily. But they did not wish to grow except by the addition of those who sincerely wished to co-operate, and who really had something to put before the public. They were out not so much for quantity in membership as for quality; and the quality they most asked for was readiness to co-operate, and readiness to serve the public in the best interests of that public. He would like, before sitting down, to refer to the excellent work his friend Mr. G. E. W. Crowe had done in organizing the Section. They were fortunate in having him as Chairman of the Section.

Mr. CROWE followed with a few remarks; and the proceedings were brought to a close with a vote of thanks to the Chairman for presiding, which was proposed by Mr. H. TEELING SMITH.

The Secretary of the Section is Mr. A. de V. Leigh, and the offices are at 1, 2, & 3, Oxford Court, Cannon Street, E.C.

FARNHAM GAS ORDER.

On Monday, June 28, Mr. J. F. RONCA (Director of Gas Administration at the Board of Trade) conducted an inquiry, at the Board of Trade Offices, Westminster, into a Special Order promoted by the Farnham Gas and Electricity Company under section 10 of the Gas Regulation Act. The main provisions of the Order are to extend the area for the supply of gas, to charge a differential price in the added area, and to authorize additional capital for gas-works purposes. There was opposition by the Farnham Rural District Council to the proposed differential charge in that part of the added area of supply which is within the Rural District. The Farnham Urban District Council, who also opposed, urged that the new capital asked for—namely, £100,000—was more than was needed, and they were also anxious to ensure that the differential price charged in the added area should be such that no additional burden would be imposed upon the consumers in the Urban District.

The Company were represented by Mr. H. F. BIDDER; the Rural District Council by Mr. C. VILLIERS BAYLEY; and the Urban District Council by Mr. A. LEES.

Mr. BIDDER said that the Company commenced operations in 1834, and was a non-statutory Company until 1910, when it was given statutory powers. The present area of supply included the Urban District of Farnham, together with most of the Farnham Rural District and a small part of the Alton Rural District. It was proposed in the present Order to add to the existing area of supply the parishes of Bentley, Coldrey, and Froyle, in the Rural District of Alton, and part of the Churt Ward of the Parish of Frensham, in the Rural District of Farnham. With regard to the additional capital of £100,000 for which powers were sought, it was proposed that the whole of it should be raised in the form of share capital, instead of in definite proportions of share and loan capital. This course was adopted in view of the intimation by the Board of Trade that they did not feel they had power to authorize loan capital in the case of an undertaking which was not solely a gas undertaking. The Company, however, were willing that power should be given to raise two-thirds of the total by means of shares, and one-third by debentures. The present authorized share capital was £110,000, made up of £59,600 ordinary and £50,400 preference. The amount authorized to be raised by debentures was £53,333—*i.e.*, half of £100,000, and one-third of £10,000. The total authorized share and loan capital, therefore, was £163,333. Of this, the amount sanctioned for gas was £129,303, and for electricity £34,030. The amount issued to Dec. 31, 1925, in respect of gas was £103,437, and for electricity £24,553, making a total issued of £127,991. The total expended, however, was £153,697, the difference of £25,706 being accounted for by a bank overdraft. The total expenditure was divided into £97,253 in respect of the gas undertaking, and £56,444 in respect of electricity. The bank overdraft had been used in respect of the electricity undertaking, while the gas undertaking was under-expended—*i.e.*, there was a slight working capital on the latter. The unissued capital amounted to £26,380 for gas and £9477 for electricity—a total of £35,857. The £100,000 new capital asked for in the present Order was solely in respect of the gas undertaking. Estimates of the cost of the work to be done in consequence of the supply to the added area amounted to £103,020. As to a suggestion made by the opponents that the Company need not seek power to raise so much as £100,000, in view of the fact that £26,380 still remained unissued in respect of the gas undertaking, Counsel said that expenditure would have to be incurred in the existing area in the near future which would use up the unexpended balance, while the whole £100,000 would be needed for the supply to the new area and the consequent enlargement of mains in the existing area.

Dealing with the provisions of the Order, Counsel said that the proposed differential charge of 3d. per therm in the added area was regarded by the Company as being fair and reasonable, and sufficient to ensure that the central area would not be paying part of the extra expenses incurred in the supply to the new areas, which were more rural and more scattered than the central area, and would also be more expensive to supply. He pointed out that, whereas the Farnham Rural District Council opposed the differential charge, the Alton Rural District Council did not; in fact, the latter welcomed the opportunity of obtaining a supply. Counsel added that this matter of the differential did not concern the Gas Company very much; they merely wanted to be fair to all consumers. With regard to the raising of new capital, the auction provisions were applied, but power was also sought to offer unissued capital by subscription. Commenting on an objection to this latter power by the Urban District Council, Counsel said that the Company's one object was to raise money as cheaply as possible, and they believed that under present-day conditions, with the bank rate fluctuating as it did, and so on, it was sometimes easier to raise capital by offering it by subscription than by auction or tender. There were precedents for the granting of this power.

The Order contained the usual clause giving power to arrange for bulk supplies to or by the Company, with the proviso that a bulk supply should not be given beyond the limits of supply if it would interfere with the proper supply within the limits. Another clause was inserted to give the Company greater security than that given by the Gas-Works (Clauses) Act in the case of a supply to premises let furnished. It provided that where such premises were let for a term less than six months, the Company should not be obliged to give a supply otherwise than on the requirements of the owner or lessee; and in any case where the owner or lessee required a supply, he should, if required by the Company, enter into the agreement provided for by section 11 of the Gas-Works (Clauses) Act, 1871. There was also a provision giving other undertakers the opportunity to seek powers to supply in the added areas if the Company did not supply there within five years.

The Farnham Urban District Council, in their objections to the sanctioning of £100,000 additional capital, for the gas undertaking, pointed out that it was too much, particularly as a similar amount of additional capital was proposed to be raised for the electricity undertaking. It was also pointed out that from the inception of the Company, in 1834, until Dec. 31, 1925, there had been expended only £97,253 on the gas undertaking. Counsel's comment on this was that the Urban District Council did not know how much had been written off, and he considered it unlikely that this was all that had been spent. Further, he did not consider that this was any argument if it were necessary to spend another £100,000, and if the Company's estimates were not excessive.

The Urban District Council also objected to the proposal to raise the whole of the new capital by shares, as being expensive, and suggested that one-third of the total should be raised by borrowing. It was contended that a well-managed statutory company should be able to borrow at 5¼ p.ct., whereas preference capital would probably not be issued at less than 6 p.ct, and investors would probably require 7 p.ct. on ordinary capital. It was also submitted that all the additional capital authorized should be raised by auction.

As to the Farnham Rural District Council's objection to the proposed differential charge, Counsel pointed out that part of the Rural District Council was within the present area of supply, and was not subject to a differential charge. Thus, if the price in the existing and the new limits of supply were uniform, at the instance of the Rural District Council, they would be robbing the Peters in the Rural District to pay the Pauls.

Mr. *A. E. Saville* (Engineer, Manager, and Secretary to the Company), in evidence, said that the consumption had increased from 60 to 116 million c.ft. from 1910 to 1925. The annual increase during the last few years had been at the rate of about 10 million c.ft., which was 8 to 10 p.ct. The plant had been re-modelled and rebuilt, mostly since the war. The carbonizing and purifying plant would be sufficient to meet requirements for the next four or five years, but additional storage was required; the present storage capacity being about 80 p.ct. of the maximum daily demand. His estimated cost of carrying out the work necessary during the next few years in consequence of the extension of area was £103,020.

Of this, extensions to existing works and plant would cost £46,900; the extension of mains in the existing area to supply the new area, and the extensions in the new area, would cost £35,300, making the total £82,200. To this he added 10 p.ct. for fees and contingencies—*i.e.*, £8220—£7600 for capitalizing the present system of slot installations; and £5000 for working capital, making a total of £103,020. As to the £26,380 of capital still unissued in respect of the gas undertaking, he said that during the last five years the Company had spent from £5000 to £6000 a year on repairs and renewals of mains, and contracts for a similar amount had been laid out this year, so that, at the present rate of development in the existing area, the unissued capial would be absorbed in five years on mains alone. It would be necessary, in order to supply the new area, to lay a high-pressure main for that specific purpose, so that the capital and interest charges on that main should be borne by the consumers in that area. The consumers in that area should also bear the extra costs consequent upon the more scattered nature of the district, the increased cost of administration, &c.

Mr. VILLIERS BAYLEY, cross-examining, pointed out that in 1910 part of the Farnham Rural District was added to the Company's limits of supply, and in 1922 another part, together with part of the Alton Rural District, was added, but no differential charges were made; and he suggested that a permanent differential in that part of the Farnham Rural District which was now to be added was not justified.

Witness held that a differential charge was justified, in view of the extra costs of supply, but agreed that the differential should diminish gradually over a period of years. He would be willing to accept a provision to that effect in the Order, so long as it did not wipe out the differential charge altogether at some future date; there must always be a differential of some sort.

COUNSEL obtained the admission from witness that, though the two new areas were similar from the point of view of their distance from the works, the Churt area was developing more rapidly than the Alton area; a good class of property was being erected there, and it was more likely to be remunerative. He urged, therefore, that for the purpose of arriving at a differential charge it was unfair to group a remunerative and an unremunerative area.

Witness would not agree that there was no ground whatever for charging a differential in Churt.

COUNSEL, in the course of further cross-examination, ascertained that part of the gas passing through the high-pressure main which it was proposed to provide for the supply to Churt would be used in the existing area of supply, and that a proportion of the capital charges on the main would be allocated to the existing area. He suggested that, instead of allocating first the whole capital charges to Churt, and deducting a proportion in respect of the gas passing through that main but used in the existing area, as had been done in this case, it would be fairer to charge to the existing area the capital cost of taking the main to the Churt boundary, and make an additional charge to Churt in respect of that part of the main which was in the Churt area. The Churt consumers would be entitled to assume that mains were already laid to their boundary.

Witness would not agree.

COUNSEL also contended that the only ground upon which a differential charge could be claimed was that supervision and the collection of accounts in Churt would cost more than in the existing area, by about £100 per annum. In view of a statement by witness that he anticipated a consumption at the outset of 16 million c.ft. per annum in Churt, this £100 could not possibly be a justification for a permanent differential of 3d.

Witness pointed out that there was no obligation to charge a differential of 3d. per therm; that figure was a maximum. He disagreed that the figure of 3d. was arrived at by guesswork, and that he had not estimated what would be a fair charge.

Cross-examination by Mr. LEES (on behalf of the Urban District Council) was directed to show that the witness's estimates as to future expenditure were too high, and that his anticipations with regard to the future developments were too rosy. As to the allocation of the capital charges on the new high-pressure main, Mr. Lees pointed out that, if it was not proposed to supply Churt, the main would not be necessary. The Company, he said, were going to spend £10,000 or more on a high-pressure main, and £6000 on low-pressure distributing mains, for the supply to Churt. Witness expected to get 300 or 400 consumers there in two years, and that the consumption would be 16 million c.ft. per annum, rising ultimately to 30 millions; but he was sceptical about this, inasmuch as the population in the new area in Churt was only about 1000.

Witness pointed out that the development there was rapid, and he foresaw no difficulty in obtaining consumers when the high-pressure main was laid.

Mr. *Arthur Collins* (Financial Adviser to Public Authorities, and who has been advising the Company in regard to their capital requirements) gave evidence in support of the financial provisions of the Order. As to the method of raising money, he said his experience was that it was not in the interests of a public utility undertaking to restrict the issue of its capital to the auction clauses altogether, and that it was sometimes cheaper to raise money by subscription.

Witness, cross-examined by Mr. Lees, said that the auction clauses had been found difficult to apply where large sums were involved.

This concluded the evidence on behalf of the Company.

Mr. BIDDER, with regard to the Urban District Council's objections to the raising of the whole of the new capital by the issue of shares, and the doubt as to whether the Board of Trade could, by Special Order, grant borrowing powers to a Company supplying both gas and electricity, said that the Company would be content to ask the Board of Trade for power to issue £70,000 share capital, and to promote a Bill in Parliament for borrowing powers up to half that amount, but only on the condition that the Farnham Urban and Rural District Councils would not oppose the granting of those borrowing powers by Parliament.

Mr. LEES said his case was that the £100,000 new capital asked for was far too much; but if Mr. Bidder's proposal were put into effect, that figure would be increased to £105,000.

Mr. BIDDER thereupon suggested that the Company might be prepared to agree that, whatever the capital powers granted, they should obtain power from the Board of Trade to raise two-thirds of it by share capital, and to go to Parliament for borrowing powers in respect of the remaining one-third, provided the Councils undertook not to oppose in Parliament.

Both Mr. Lees and Mr. Villiers Bayley were originally disposed to think that their Councils would agree to that, but they suggested that the Company might also undertake to go to Parliament for borrowing powers within a stated period. It was pointed out that the Company, having obtained power from the Board of Trade to issue share capital, might not go to Parliament for borrowing powers, but might apply to the Board, (say) five years hence, for new capital powers. They wanted to prevent that.

Mr. RONCA asked whether, if the Company did not apply to Parliament for borrowing powers within three years, they would expect the undertaking given by the two Councils, not to oppose, to hold good.

Mr. BIDDER supposed they would.

Ultimately, it was decided that no such undertaking should be given.

Mr. *Arthur Valon* then gave evidence on behalf of the Farnham Rural District Council, and described the new area in Churt as being promising from the point of view of gas supply, in view of the development and the class of property being erected. Indeed, if it continued to develop as at present, it would probably become the most lucrative area in the Company's limits of supply. No permanent differential charge ought to be sanctioned. The Company had estimated the consumption per consumer per annum at 40,000 c.ft., which was based, he believed, on the average in the existing area; but to his mind it would be more than that in the new area, so that costs of administration would be lower per 1000 c.ft. In a calculation which he made with a view to arriving at a fair differential charge in Churt, Mr. Valon said that £1200 per mile for the 6-in. high-pressure steel main was a fair figure, instead of the Company's estimate of £2000 per mile. The length of the main would be about 6 miles, so that the cost would be £7200, to which he added £800 for compressors, making £8000. Interest on that sum at 6 p.ct. would amount to £480 per annum, and that, spread over the 16 million c.ft. (the estimated consumption per annum in the new Churt area immediately) gave a figure of 1·56d. per therm. The estimated extra cost of management, as compared with the existing area, was £100 per annum, equivalent to 0·32d. per therm, and the cost of compression he estimated at 0·1d. per therm. The extra costs amounted to 1·98d. per therm, and he suggested, therefore, that a fair differential to begin with was 2d. per therm. At the same time, he expressed the view that the 6-in. high-pressure main was far too big for an annual consumption of 16 million c.ft., and even when the consumption rose to 30 millions, a 4-in. main working at something under 25 lbs. pressure would be sufficient. With a 6-in. main a pressure of only about 4 lbs. was necessary. It was nonsense to say that it would be relatively more expensive to supply the part of the Rural District now proposed to be taken over than to supply that part which was taken over in 1922; indeed, it would be less expensive, because the consumption would be bigger. His figures, he said, were based upon the Company's scheme, and on the assumption that the high-pressure main would be used for no other purpose than to supply the new area; they were not based upon what he considered to be the most economical scheme. The area was a perfect one for high-pressure individual distribution.

Cross-examined, witness agreed that there should be a reasonable differential, because without it the Company might not supply in that area at all.

Mr. BIDDER, in further cross-examination, suggested that it was not unreasonable to expect a demand of 60 million c.ft. per annum eventually, which would be supplied through this main.

Witness agreed that if that consumption was likely to be reached within ten years, he would lay the 6-in. main now. If Mr. Saville had given him an instance of a steel-welded main laid in that district, and which had cost £2000 per mile, he would have considered it very carefully; but, without such evidence, he had to rely on his own experience, which was that £1200 was a full price.

Mr. VILLIERS BAYLEY, summing-up on behalf of the Farnham Rural District Council, said that the Company had failed dismally to make out any case whatever for a differential. Such case as had been made out had been made on behalf of the Rural District Council, who were opposing, and that was evidence of the fairness of their attitude. If the whole of the capital cost of the high-pressure main were to be borne by the consumers in the new Churt area, then, in so far as the main was used for the supply to the existing area, the Churt consumers were financing those in the existing area. This was the reverse of the usual practice. The Rural District Council could not help being influenced by the fact that the consumers in the new area wanted a supply; but they were anxious to hold the scales as fairly as possible between the different parts of the Rural District. He submitted that the Company did not know how the 3d. was arrived at, but had put it forward as being a reasonable figure. If Mr. Saville was right in his admission that the Alton area would not be so remunerative as the Churt area, why should the consumers in Churt be saddled with a differential equal to that charged in Alton? If 3d. was fair in Alton, obviously the charge could be less in Churt. He suggested that Mr. Valon's figure of 2d. per therm should be the differential charge allowed in Churt for three years, gradually diminishing thereafter until it disappeared.

Mr. *George Evetts* (for the Farnham Urban District Council) gave evidence. On the volume basis, he said, there had been an increase in demand in the Company's area of supply of 4¼ p.ct. compound per annum in the last twenty years, and 5·8 p.ct. compound in the

last five years. Assuming an increase of 5 p.ct. compound for the next twelve years, the sale after that time would be 188·2 millions, or 83·4 millions in excess of the present sale. The cost per million should not be more than £800, so that the figure for development and sale of 83·4 millions in the next twelve years should be £66,720. Allowing working capital, and capitalizing the sum of £7200 standing to the suspense account in connection with the present system of slot installations, £80,000 should be ample for that period. He criticized Mr. Saville's estimates, and made suggestions for their reduction. The first figure dealt with was £18,000 for new carbonizing plant. With a possible increase in demand of 80 million c.ft. per annum, it was proposed to increase the carbonizing capacity by 190 millions per annum. He suggested, therefore, that the extra capacity should be installed in two units, and that only £9000 should be spent in the next twelve years; the remaining £9000 being unnecessary. As to the gasholder, a storage capacity of 80 p.ct. of the maximum daily demand was about the standard to-day; 75 p.ct. was the figure given by Mr. Newbigging and others, and in practice was found to be sufficient. If it were necessary to erect the holder during the next twelve years, the Company might just as well obtain powers now; but the estimated cost of £19,500 was excessive for a capacity of 500,000 c.ft. He regarded £16,500 as being a fair price for a gasholder (with foundations) of such a capacity. Therefore, he had deducted another £3000 from Mr. Saville's estimates, which, together with the £9000 in respect of carbonizing plant, made a total of £12,000. He could not question Mr. Saville's costs for mains and extensions if he were paying those sums under tender, but, in view of the fact that those costs were high, there was no need for the 10 p.ct. (£8220) estimated for contingencies, because the contingencies would not arise. Therefore, he deducted £20,220 from Mr. Saville's total of £103,020, leaving a figure of £82,800. As to the differential, he calculated that, assuming a consumption of 30 million c.ft. per annum in Churt, the interest on capital alone would amount to 1·1d. per therm, apart from sinking fund charges. He calculated the cost of boosting at 0·4d., and repairs and deterioration at 0·5d., per therm, and the three figures totalled 2d. per therm. Inasmuch as the consumption in Churt in the early years would be only 16 million c.ft. per annum, however, he suggested that a differential of 3d. per therm would be fair for the first five years, and 2d. per therm for the next seven years, leaving the figure beyond that period to be decided later.

Mr. BIDDER, in his cross-examination, said it seemed to him that the best solution would be to allow the Company to do what they thought best in the interests of all.

Mr. LEES, summing up on behalf of the Urban District Council, suggested that there was no chance whatever of an expenditure of £103,020 being necessary within the next twelve years, and that £80,000 would see the Company well through that period. The whole amount, however, should not be raised by the issue of shares, the only effect of which would be to penalize the consumers, because debenture capital could be raised at 2 p.ct. less than ordinary and 1 p.ct. less than preference capital. If the Board of Trade had not the power to authorize a Company supplying both gas and electricity to borrow money in respect of the gas undertaking, then the Company ought to go to Parliament to get borrowing powers; because, if the practice of authorizing them to raise the whole of the capital by the issue of shares were perpetuated, the consumers would be penalized simply because the Company supplied electricity as well as gas. Again, the Company was not a small one, and should not find difficulty in raising capital; therefore, it should be raised openly by auction or tender. On the question of the differential, he said the Urban District Council would have the strongest possible objection to the extension of the Company's area of supply unless they were satisfied that the consumers in the Urban District would not have to subsidize those in the outer areas. He asked the Board of Trade not to allow the extension of area on terms more favourable to the Alton Rural District Council than those with which that Council were satisfied, but added that he would be surprised if gas were supplied there in the next fifteen years.

Mr. BIDDER, in his concluding remarks, said that Mr. Evetts' figures were based on a rate of increase in consumption which was less than the actual rate of increase. Therefore, the capital powers asked for were necessary for the proper extension of the business during the next few years, in the public interest. If the consumption increased as it had done this year, an increased capacity of 150 million c.ft. per annum in the next ten years would only be sufficient to supply the present area, apart from the new area.

The inquiry then closed.

GAS REGULATION ACT APPLICATIONS.

There has appeared in the "London Gazette" the following notice regarding an application to the Board of Trade under the Act.

SPECIAL ORDER.

Leighton Buzzard Gas Company.

To change the name of the Company; to authorize the acquisition of scheduled lands for gas-works purposes; to enable the Company to raise further capital; to fix standard rates of dividend; and for other purposes.

Teignmouth Gas Department.—The accounts for the year ended March 31, submitted by Mr. H. Higham, the Engineer and Manager, show a gross profit of £2402; and after providing for interest and repayment of capital, there remains a balance of £208. The price of gas was 1s. per therm throughout the year, with discount for large quantities. The amount sold was 68 million c.ft.—an increase of 3 p.ct.

BIRMINGHAM GAS DEPARTMENT.

Over £40,000 to the Relief of the Rates.

The annual report of the Birmingham Gas Department (which will be presented at the meeting of the City Council on July 6) states that £41,200 is to be contributed from profits to the relief of rates. The accounts show a surplus of £86,397, of which £45,197 has been transferred to renewals and special expenditure account. The sum of £275,000 was authorized to be borrowed during the year for new mains and new meters. Of that amount £100,000 had been received; the balance of £175,000 still remaining to be borrowed. The total capital raised amounted to £3,510,604—an increase of £100,000 compared with the previous year. The sum of £1,487,743 had been redeemed, leaving £2,022,860 outstanding, against £1,968,293 at March 31, 1925. During the year, annuities to the value of £9970 were redeemed at a discount of £1824 through the sinking fund established for their extinction. In addition to the above amount, repayments on account of stock and mortgages had been made, which brought up the total of capital redeemed during the year to £45,432. The revenue account showed an expenditure of £2,130,592, and a balance carried to the credit of profit and loss account of £272,053.

The coal carbonized during the year amounted to 817,076 tons—an increase of 6966 tons compared with 1924-25. The quantity of gas oil used in the production of carburetted water gas was 1,711,591 gallons, a reduction of rather more than 23,000 gallons in comparison with the figure appearing at March, 1925. The gas sold and used on the works exceeded 13,389 million c.ft., which constituted a record in the history of the Department; the excess over the previous highest figure being upwards of 730 million c.ft.—an increase of 5¾ p.ct. Regret was expressed by the Gas Committee at the continued depression in the residuals market, which was reflected in the reduced income from coke and breeze, tar, and ammoniacal liquor. That reduction during the year was £171,894. The value of the allowance made by the Department in respect of public lighting amounted to £29,168.

A suggestion is put forward, after consultation with the Finance Committee, in favour of capitalizing the expenditure on constructional work, to the extent of £546,681, which had taken place since April, 1922; and a recommendation is made for sanction to borrow that amount.

The following statistics show the increases that were made last year in the several branches of the undertaking.

—	1925.	1926.	Increase.
Gas sold during the year, c.ft.	12,659,612,900	13,389,831,100	730,218,200 = 5·77 p.ct.
New services laid during the year	8,212	10,793	2,581
Cooking and heating stoves sold during the year	4,628	5,607	979
Total number of cooking and heating stoves on hire at March 31	89,453	102,492	13,039
Total number of cookers supplied with prepayment meters at March 31	106,183	111,632	5,449
Total number of prepayment meters fixed or on consumers' premises at March 31	110,716	116,692	5,976
Total number of ordinary meters fixed or on consumers' premises at March 31	99,271	102,283	3,012

MINISTER OF HEALTH AND THE SANITARY CONGRESS.

There was a large gathering in the Guildhall on Monday afternoon of this week to hear the Inaugural Address of the President of the Royal Sanitary Institute, the Right Hon. Neville Chamberlain, M.P. (Minister of Health). In addition to the prominence in public life of the President, the occasion was of special importance, inasmuch as this is the jubilee year of the Institute. His Grace the Duke of Northumberland, K.G., occupied the chair; and in the course of the proceedings a telegram was read from His Majesty the King (who is Patron of the Institute), offering hearty congratulations on the useful and beneficent results of the work achieved in the past fifty years by the Institute, and expressing the hope that its endeavours to promote the welfare of the people in this country and throughout the Empire may be blessed with every success. Unfortunately, Mr. Chamberlain's urgent parliamentary duties prevented him from remaining at the Guildhall to deliver his address; and so, after a short speech, he left it to be read for him by one of the principal officials of his Department.

Contrasting the new conditions with the old, Mr. Chamberlain said that the expansion of the Institute itself is a testimony to the new conditions. In the first year of its existence its total membership did not exceed 100; to-day the membership is approaching 5000. The modest seed of its early work has expanded into a large tree of activities. This progress has been due to the energy and faith of the many men who have worked earnestly in its interests. It is a source of much gratification to those who through many years have been active in the service of the Institute that it has still as its Secretary, Mr. White Wallis, who has served it for no less a period than 45 years. The place of public health measures in the life of the community is illustrated by public expenditure. In the year 1875-6, the gross expenditure, from revenue and from loans, of local authorities in England and Wales on public health services appears to have been just over £5,000,000; in 1923-4, the figure was over £61,000,000, and, in addition, over £27,000,000 was spent on hous-

ing in that year. The reduced death rates are only an indication of the progress which has been made. There has been a large increase in the expectation of life, and the added years have been largely to working life. There has in consequence been a great economic gain to the community. Furthermore—and this is of no small importance—because of the lengthened life of the breadwinner, there has been added security for family life.

SMOKE ABATEMENT.

Later in his address, Mr. Chamberlain said: There are new advances to be made in improving environmental conditions. Just recently the House of Commons has given a second reading to the Smoke Abatement Bill. Some manufacturers are complaining that this is not a time to introduce measures which may place a fresh liability on industry. Enthusiasts, on the other hand, are protesting that the Bill is much too weak. I admit that the Bill is not a drastic one; the present is not a time for rigorous measures of this description. But I am satisfied that, if the Bill passes, and if local authorities administer it and the present law with thoroughness and with sympathy, substantial improvements will be effected without any harm to industry.

HOUSING.

The importance of the progress made in solving the housing problem was evident from figures quoted in the address. It appears that since 1919 over 670,000 houses have been built, over 413,000 of them with assistance from the Exchequer. A further 87,000 are in course of erection, and 137,000 more have been authorized, but not yet commenced, with this same assistance. The loans which have been sanctioned by his Department for housing from 1919 to April of this year run to the great total of over £308,000,000. Recently much progress has been made in stimulating the acquisition of houses by occupiers. Since the beginning of 1923 about £27,000,000 has been sanctioned as loans to local authorities for advances to owner-occupiers and others for the purchase or erection of houses.

RESEARCH.

In research work, said the President, there are still unlimited fields. We are a strange people in many respects. No country has a richer record of original discoveries, whether in science or in industry. At the same time, there are few Western Countries where pure research is so much a Cinderella. We are always inclined to begrudge the spending of money on anything which does not produce immediate results, forgetting that, time and again, experience has shown the unsuspected returns from investigations which seemed Utopian.

The Institute has played a great part in the past in educating public opinion. The need for that education is now greater than ever.

COAL TRADE IN THE MIDLANDS.

From Our Local Correspondent.

The control is becoming stricter in the Midland area, though the meshes of the net are not so small as to intercept all the fuel that comes to market. There is a more regular output from isolated collieries where the men have returned. On the whole, however, supplies have not increased to any material extent. Having regard to the extreme flatness of the domestic demand, merchants think that more consideration might be given to industry in the allocation of the tonnage which is coming forward. Westphalian and Silesian coals are making their appearance at many of the works now. Those industrialists who are giving them a trial in this extremity are no longer at a loss to understand why British coal is so widely preferred in the world's markets. It was reported on 'Change last week that twelve boilers fired with imported coal were required to do the work ordinarily done by four boilers at a steel-rolling plant in the district. Within a few miles of Birmingham half-forgotten deposits of slack buried under 2 ft. of soil are being sorted out and cleaned for dispatch to cotton mills in Lancashire. The price on rail is about 15s., and the charge into consumers' mills is about double this. A small amount of coal is recovered from these buried stores.

Low grades of coke still come to hand from Durham and South Wales. Foundries keep going in spite of all difficulties.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

Inquiries in Yorkshire and Lancashire coal trade circles reveal the fact that there is no danger of public utility works running short of fuel. Foreign cargoes are now arriving in sufficient bulk to ensure continuous working for some months ahead. The main portion of the coal received up to now appears to be giving general satisfaction; and although there is some difficulty in loading at the nearer Continental ports, this is not of such serious moment as to cause any great amount of inconvenience.

Prices are naturally fluctuating in accordance with the date of delivery.

Gas Supply in Italy.—Gas enterprises in Italy have completed their yearly accounts, and all have earned very large profits. The Società-Italiana del Gas, with headquarters at Turin, owners of 25 Italian gas undertakings, having a capital of 146 million lira, show a net profit for 1925 of 22 million lira. After providing for debenture interest and reserve funds, they are paying a dividend of 25 p.ct., or 25 lira, on 800,000 shares of 100 lira each. These results are very creditable, but are not surprising when one considers that coal costs about 30s. a ton and coke sells at £3, and that residuals alone return about 7s. a ton more than the coal costs.

CURRENT SALES OF GAS PRODUCTS

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *July* 5.

The tar products market in London is very quiet, and producers are disinclined to make forward sales until the coal situation is somewhat clearer.

Inquiries for pitch are beginning to be received from the Continent for next season; but as there has been practically no production from the coke ovens since the beginning of the coal strike, it is quite clear that the usual quantities required will not be available for shipment during the autumn.

Creosote is rising steadily, and to-day's value is 7¾d. per gallon in bulk at works.

Benzole, toluole, and naphtha are becoming very scarce, and prices are firm.

Tar Products in the Provinces.

July 5.

Owing to the continuance of the coal strike there is little or no business doing in tar products. Manufacturers are afraid to quote for forward delivery, not knowing whether or not they will receive tar in sufficient quantity to do more than execute the contracts already entered into.

The market for pitch is firm; but the Continental buyers are not inclined to pay the prices which are asked.

The creosote market is very firm indeed. There are a great number of inquiries for home consumption; while those for export continue good.

Benzole and solvent are very firm indeed, and there is a big demand, particularly for the former.

The average values for gas-works products during the week were: Gas-works tar, 55s. to 60s. Pitch, East Coast, 79s. to 80s. f.o.b. West Coast—Manchester, 73s. to 74s.; Liverpool, 75s. to 76s.; Clyde, 79s. to 80s. Benzole, 90 p.ct. North, 1s. 11d. to 2s.; crude, 65 p.ct. at 120° C., 1s. 3¼d. to 1s. 4d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 11d. to 2s. Toluole, naked, North, 1s. 11d. to 2s. nominal. Coal-tar crude naphtha, in bulk, North, 8½d. to 9d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 10d. Heavy naphtha, North, 1s. to 1s. 1d. Creosote, in bulk, North, liquid, 6¾d. to 6½d.; salty, 6½d. to 6¼d.; Scotland, 5¾d. to 6d. Heavy oils, in bulk, North, 7¼d. to 7½d. Carbolic acid, 1s. 4d. to 1s. 5d. prompt. Naphthalene, £11 to £14; salts, £4 10s. to £6, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

TRADE NOTES.

Gas-Works Plant.

Messrs. Ashmore, Benson, Pease, & Co., Ltd., Stockton-on-Tees, have published a booklet illustrating some of their work. The illustrations indicate the varied range of their manufactures.

Holder for Chesterfield.

The Gas Committee of the Chesterfield Corporation have accepted the tender of Messrs. Robert Dempster & Sons for a three-lift holder; and they recommend the Council to ask the Ministry of Health for a loan to enable them to proceed with the scheme.

Morris Electric Cranes.

Messrs. Herbert Morris, Ltd., of Loughborough, have published an illustrated booklet (No. 109) dealing with their widely-used electric cranes. It is markedly different from the ordinary stereotyped catalogue. It contains little in the way of tabulated data, but on the other hand its 32 pages are crowded with practical thoughts.

"Foochow" Enamel Paint.

Offered in 36 standard shades, by Messrs. Donald Macpherson & Co., Ltd., of Knott Mill, Manchester, "Foochow" enamel paint is a high-grade pure oil paint, manufactured from the very best quality linseed oil obtainable. A descriptive circular received from the firm points out that this enamel paint is the outcome of years of careful research and experiment. It is recommended for all classes of work.

Incandescent Mantles, Burners, and Glassware.

Intimation has been received from Mr. T. Harris, founder and Director of Messrs. Albert Lee & Co., Ltd., that he has now relinquished his position with this firm, and has been appointed Chairman and Director of Messrs. Harris, Williams, & Co., Ltd., suppliers of incandescent mantles, burners, glass ware, &c., of 48, Fore Street, London, E.C. 2. Mr. Harris will work in conjunction with Mr. J. E. Allden, who will act in the capacity of General Manager.

Reavell Portable Compressors.

A new pamphlet (No. 113A) gives particulars of the 1926 type portable compressors of Messrs. Reavell & Co., Ltd., Ranelagh Works, Ipswich. The firm have been making portable compressors for many years; but the latest type embodies certain improvements, such as the elimination of gears between the engine and compressor, the adoption of higher speeds for the compressors (based on the results of a series of experiments on valves for high speeds), also the use of a petrol or paraffin "Atlantic" engine, designed expressly for motor-boat work, and found by experience to be well suited to the arduous conditions imposed on portable compressors, which have to run for long periods at full load. Another novelty is the reconstruction of the No. 1 size, which is now so small that it will pass through a 3 ft. doorway, and has been designed for contractors' use in the erection of large steel-riveted structures, for operating pneumatic tools for boiler cleaning, or similar purposes, where a portable machine is required to operate a small number of pneumatic tools.

CONTRACTS OPEN.

Oxide of Iron.

Tenders are invited by the City of Salford for the supply of oxide of iron purifying materials. [See advert. on p. 45.]

Cheaper Gas at Dublin.—The price of gas at Dublin has been reduced by 1¼d. per therm.

Yorkshire Tar Distillers, Ltd.—Under this title there has been registered a private Company, with a nominal capital of £1000, to carry on business as tar and ammonia distillers, &c.

Silesian Coal for Dundee.—The Dundee Gas Committee have bought 2500 tons of Silesian coal at 34s. 3d. per ton. This amount will keep the gas-works going until the end of July.

Towns Without Gas.—The supply of gas of the Eckington and Mosboro' Gas Company and of the Killamarsh Gas Company has become exhausted through the shortage of coal as the result of the miners' strike.

Profits at Morley.—The Morley Corporation have made a net profit on their gas-works for the past year of over £1100, compared with £305 last year. During the 27 years that the Corporation have administered the gas undertaking there have been only two occasions (1903 and 1914) when a larger net profit was made.

Gas Light and Coke Company's Amending Order.—The Public Control Committee of the London County Council record the issue by the Board of Trade of an Order dated June 2, entitled the Gas Light and Coke Company (Charges) Amending Order, 1926, fixing the revised standard price of gas supplied by the Company at 11·4d. per therm, as desired by the Company.

St. Marychurch Gas-Works.—For the purpose of considering the application which has been made to the Board of Trade by the Torquay and Paignton Gas Company for a Special Order under section 10 of the Gas Regulation Act, providing for the transfer of the undertaking at St. Marychurch to the Torquay Gas Company, an extraordinary general meeting of the shareholders was held at the Company's offices on Thursday, July 1. A resolution approving the application was carried unanimously, and a sum of £100 was voted to the Directors.

Price Reduced at Abergavenny.—The Gas Committee of the Abergavenny Town Council made a recommendation to the last meeting of the Town Council that the price of gas be reduced 6d. per 1000 c.ft., from 4s. 9d. to 4s. 3d. An amendment to reduce it a further 3d. to 4s. was proposed; and Alderman Rosser, in supporting it, said he had studied the monthly tabulated retort of the Gas Manager, and congratulated him on the excellent showing. On the basis of raw material and the reduced cost of labour, and the figures of gross and net profit, the Committee could without any serious risk reduce the price of gas to 4s. Mr. Telford said that the Committee had gone very carefully into the matter; and this year the net profit was only £682, against £710 last year; and if they took off another 3d. it would mean that next year there would be no profit at all. Eventually the recommendation was adopted.

Bolton Gas Department Accounts.—The Chairman of the Bolton Corporation Gas Committee (Mr. Thomas Glaister) reports that the undertaking continues in a sound financial condition. The year's results have been eminently satisfactory, and have been obtained without any increase in the price of gas. In fact, during the year the Committee made concessions to the street lighting authority which cost the Gas Department over £1000 a year. The continued slump in the markets for residual products has been faced, and the uncertainty in the industrial world has reflected on the gas consumptions. In spite of these set-backs, however, there is a gross profit of £65,445, and a net balance on the year of £5848. A sum of £14,000 has been placed to the renewals fund and £5179 to the capital account, leaving a balance to be carried forward of over £30,000. The make of gas was 1,273,142,300 c.ft. as compared with 1,217,213,000 c.ft. for the previous year.

Gas v. Coal Fired Wash Boilers.—The Wednesfield Urban District Council have discussed the question of gas *v* coal-heated boilers, as applied to certain houses erected, and about to be erected, by them. Mr. Ratcliffe, who introduced the question, said that a memorial had been sent by the Tenants' Association to the Clerk to the Council, pointing out that the gas-heated boilers already in certain houses made wash-day a more expensive affair than if coal-heated installations had been fitted, and asking the Council if anything could be done in the matter. It was pointed out, however, that the contract for building on the present plan was already settled, and the alteration would involve an increase in the cost of the houses, with consequent further application to the Ministry of Health, and a higher rent when completed. It was decided that the Surveyor should carry out a series of practical tests in one or two houses, in order to ascertain the actual cost of the gas heated apparatus at present in use.

Address at Putney.—An interesting address on the gas industry was given by Mr. C. M. Croft, Chief Engineer of the Wandsworth, Wimbledon, and Epsom District Gas Company, at a meeting of the Putney Rotary Club on June 21. Mr. Croft dealt with the magnitude of the industry, and its utility, and also spoke on attendant legislation. He pointed out in connection with the magnitude of the industry that the capital invested was second in amount to that of the railways—*i.e.*, £185,000,000. Coal consumption was 17,202,000 tons, and the gas made in 1925 totalled 274,551 million cubic feet. The number of consumers was 8,278,664; while people served numbered 36 millions. The wages in the industry amounted to £15,000,000 per annum. Of the bye-products, 9 million tons of smokeless fuel was secured in the form of coke; 172 million gallons of tar (road tar, carbolic acid, creosote, naphthalene, pitch, &c.); and 167,000 tons of sulphate of ammonia. The industry contributed, moreover, in rates and taxes, £3,500,000 per annum.

Lancaster Gas Department.

The report of the Lancaster Gas Engineer (Mr. G. Dixon, B.Eng., Assoc.M.Inst.C.E.) states that the receipts for 1925-26 were £76,059, and the expenditure was £64,338. Of the gross profit (£11,721), £2464 went in interest, and £3615 in redemption, while £3345 was paid in income-tax. The net profit was £2276, out of which £1000 went to the relief of the rates, and £1276 was placed to reserve. Residuals realized £17,462, or 64·3 p.ct. of the total cost of coal, against 74·4 p.ct. last year and 89·5 p.ct. in 1924. The average price received per 1000 c.ft. of gas was 2s. 6·87d. Outside shop lighting has been most popular. The unaccounted-for gas amounted to 6·8 p.ct.

Yeovil Price Reduction.—The Yeovil Town Council have reduced the price of gas supplied through ordinary meters from 4s. 4·8d. to 4s. per 1000 c.ft., with a corresponding reduction to prepayment consumers. Out of the surplus revenue from the gas undertaking £1000 is to be transferred to the relief of the rates.

Co-Partnership in Practice.—The following notice has been displayed at all stations of the Brighton and Hove General Gas Company: The Directors have observed, and desire to recognize, the constancy and admirable demeanour of the co-partners and all serving the Company during the generally disturbed conditions prevailing. The services so rendered to the local community and the country at large are even more important than those now so cordially acknowledged by the Board.

Special Libraries Directory.—Our readers are probably aware that, in view of the enormous amount of scientific and other special information now available in periodicals and libraries, an association—the Association of Special Libraries and Information Bureaux—has been formed to assist in making such information available to all who wish to use it. Associate membership is open to anyone interested. With the assistance of the Carnegie United Kingdom Trust, the Association has undertaken, as one of its first activities, the compilation of a directory of sources of specialized information in Great Britain and Ireland. The General Editorship of this important work has been entrusted to Mr. G. F. Barwick, late Keeper of Printed Books at the British Museum.

Reading's Growing Gas Consumption.—A review of the gas industry and its rapid progress during the past few years was the subject of an interesting address to the Reading Rotary Club by Mr. Douglas H. Helps, Managing Director of the Reading Gas Company. He entitled his remarks "The Service which the Gas Industry renders to the Community," saying it was desirable that someone should speak to them on the subject, as he did not think the service which the industry carried out was properly recognized. As an instance of the growth of the industry, the Reading Company distributed 77 million c.ft. more gas during the past twelve months than in any previous year. In Reading the consumption of gas doubled every eighteen years, and in the British Isles during the last twenty years it had increased by 70 p.ct.

Owing to the continuance of the coal strike, the gas supply at Chatburn is being restricted.

The net profit on the operations of the Lurgan Municipal Gas-Works for the year ended March last was £2014.

The Plymouth Corporation Gas Committee have refused to entertain a claim by Mr. W. P. Tervet, the late Engineer, for salary in lieu of notice.

The Accrington Gas Board have adopted the Superannuation Act for their employees. Application is to be made for exemptions from Health and Unemployment Insurance Acts in respect of officials only.

While following his employment at the works of the Fleetwood Gas Company, on June 24, F. Bradley, of Middleton, had his arm caught in a driving belt. He was removed to the local hospital, where he was detained.

When a tar still caught fire at the works at Lower Sydenham of the South Suburban Gas Company, strenuous efforts were made by the staff to deal with the outbreak, which was finally overcome by the fire brigade.

Although warned by their engineer that the gas-works will have to close down, and the supply of gas be thus entirely cut off, Glyncorrwg Urban District Council, with a Labour majority, have decided to order no foreign coal. There is no supply of electricity available for domestic purposes.

The Burnley Corporation have purchased two sets of apparatus to aid in the restoration of people overcome by coal gas poisoning; one being in charge of the Gas Department, and the other at the police station. The public have been warned to lose no time, in cases of gas poisoning, in notifying the police, who will take the apparatus by motor to where it it wanted.

An inquiry was held at Bournemouth into the circumstances attending the death of George Young, a gasfitter in the employ of the Bournemouth Gas and Water Company. The main facts were that, with others, Young was engaged on the construction of the Company's premises in Old Christchurch Road. On June 4, while working on a scaffold, there was an explosion, and he was thrown to the ground, sustaining injuries from which he subsequently died. The Coroner (Mr. F. G. Lefroy), in his opening remarks, observed that there was a leakage of gas, and the deceased lit a match. An explosion followed, and he was thrown to the ground. Mr. Lewis Manning (representing the widow) sought to lay before the Court the view that there were circumstances pointing to the fact that deceased did not light a match. The jury returned a verdict to the effect that deceased died from a fracture of the base of the skull, as the result of a fall.

STOCK MARKET REPORT.

BUSINESS on the Stock Exchange last week continued to be satisfactory; and with the turn of the half-year the dividend distribution brought about an appreciable increase in orders. It must not be overlooked, however, that the large demand for investment stocks is due to the use of monies which but for the coal stoppage would be utilized for trade purposes. It is an open secret that a reduction in the Bank Rate would have been made some weeks ago had it not been for the strike; and it is rumoured that a reduction can no longer be delayed.

French Rentes and other securities were depressed, and the formation of a new government, with the usual declaration of determined action, has apparently had no effect on the position.

In the Railway Market there was some anxiety with regard to the interim dividend announcements; but prices were rather better on balance on renewed hopes of a settlement of the coal difficulties.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr	Dividends. Last Hf. Yr.	NAME.	Quotations. July 2.	Rise or Fall on week.	Transaction Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 4	5	5	Aldershot 5 p.c. max. C.	74—77	..	..
322,992	"	"	4	4	Do. 4 p.c. Pref.	69—74	..	..
1,551,868	"	Apl. 1	6½	6½	Alliance & Dublin Ord.	75—80	..	..
374,000	"	Jan. 7	4	4	Do. 4 p.c. Deb.	60—65	..	78½—80
‖ 300,000	1	May 6	1/7½	1/7½	Bombay, Ltd.	1⅛—1⅛	..	..
170,000	10	Mar. 4	8½	8½	Bournemouth 5 p.c.	12—13	..	..
425,050	10	"	7	7	Do. B 7 p.c.	12—12½	..	..
275,000	10	"	6	6	Do. Pref. 6 p.c.	11—12	..	..
50,000	Stk.	June 24	3	3	Do. 3 p.c. Deb.	54—57*	..	..
162,025	"	"	4	4	Do. 4 p.c. Deb.	74—77*	..	57½
214,740	"	Mar. 18	12	12	Brighton & Hove Orig.	167—172	..	76
244,200	"	"	9	9	Do. A Ord.	128—133	..	..
1,287,500	"	Feb. 18	5	5	Bristol 5 p.c. max.	88—89a	..	..
855,000	"	Mar. 18	8	7	British Ord.	99—104	..	..
100,000	"	June 24	7	7	Do. 7 p.c. Pref.	114—119*	..	101—101½
120,000	"	"	4	4	Do. 4 p.c. Red. Deb.	68—73*	..	..
100,000	10	June 10	6	8	Cape Town, Ltd.	6½—7½	..	..
100,000	10	Apl. 22	4½	4½	Do. 4½ p.c. Pref.	5⅝—6⅝	..	..
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb.	66—71*	..	..
626,860	"	Feb. 18	6	6	Cardiff Con. Ord.	96—99	..	..
237,860	"	June 24	7½	7½	Do. 7½ p.c. Red. Deb.	93—101*	..	..
157,150	"	Mar. 4	5	6½	Chester 5 p.c. Ord.	87½—92½b	..	..
79,185	1	Apl. 22	†2/-	†2/-	Colombo Ltd. Ord.	28/—30/-	..	..
24,495	1	"	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	20/—22/-	..	..
1,513,280	Stk.	Mar. 4	5½	5½	Commercial 4 p.c. Cap.	78—81	..	..
560,000	"	"	5/3/4	5/3/4	Do. 3½ p.c. Cap.	77—80	..	79¾—79½
475,000	"	June 24	3	3	Do 3 p.c. Deb.	54—57*	..	..
800,000	"	Oct. 8	—	4	Continental Union, Ltd.	26—31	..	55
200,000	"	Mar. 4	7	7	Do. 7 p.c. Pref.	85—88	..	27½—28½
737,150	"	Mar. 4	6½	6½	Croydon sliding scale	95—98	..	87
403,100	"	"	5	5	Do. max. div.	79—82	..	96—97
492,270	"	Mar. 4	6	9	Derby Con.	107—109c	..	..
65,000	"	June 24	4	4	Do. Deb.	73—75c*	−1	..
209,000	"	Mar. 4	5	5	East Hull Ord. 5 p.c.	86—89	..	..
50,000	"	June 24	†6	†4	Eastbourne 5 p.c. Deb.	91—96*	..	..
1,002,180	10	Apl. 1	5½	5	European, Ltd.	5—6	..	..
18,788,960	Stk.	Feb. 18	4/17/4	4/17/4	Gas Light & Coke 4 p.c. Ord.	83¼—85½	−1½	5⅛
2,600,000	"	"	3½	3½	Do. 3½ p.c. max.	58—61	..	83½—86½
4,157,020	"	"	4	4	Do. 4 p.c. Con. Pref.	76—79	..	..
5,602,620	"	June 24	3	3	Do. 3 p.c. Con. Deb.	58—61*	+2	76½—78½
181,315	"	"	—	—	Do. 6 p.c. Br'tf'd Rd. Db.	100—105*	..	58½—59
130,000	"	—	10	10	Do. 10 p.c. Deb.	..	..	..
42,000	"	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	"	Mar. 18	6⅔	6⅔	Hastings & St L. 5 p.c. Conv	88—93	..	..
258,740	"	"	5½	5½	Do. 3½ p.c. Conv.	68—73	..	..
70,000	10	June 10	†10	†10	Hongkong & China, Ltd.	19½—20½	..	72
173,200	Stk.	Mar. 4	10	10	Hornsey Con. 3½ p.c.	66—68	..	20½
1,976,000	"	May 20	10	‡10	Imperial Continental Cap.	123—128	..	66—67½
226,170	"	Feb. 4	3½	3½	Do. 3½ p.c. Red. Deb.	69—72	..	123—124
235,242	"	Mar. 18	6½	6½	Lea Bridge 5 p.c. Ord.	95—100	..	..
2,127,340	"	Feb. 18	5½	5½	Liverpool 5 p.c. Ord.	80—81b	..	..
600,000	"	Mar 18	7	7	Do. 7 p.c. Red. Pref.	102¾—104¼b	+1¼	..
165,736	"	Feb. 18	9	8	Maidstone 5 p.c. Cap.	115—120	..	103¾
63,480	"	June 24	3	3	Do. 3 p.c. Deb.	53—58*	..	115—115⅞
75,000	5	June 24	†6	†7	Malta & Mediterranean	5¼—5⅜*	+¼	..
541,920	Stk.	May 20	†4	†6	Montevideo, Ltd.	75—78	..	5⅛—5⅜
2,061,315	"	Mar. 4	5	5	Newcastle & Gateshead Con.	69½—70¼d	..	77½
360,929	"	"	4	4	Do. 4 p.c. Pref.	75—76d	..	..
529,705	"	June 24	3½	3½	Do. 3½ p.c. Deb.	68—70d*	..	..
15,000	"	Mar. 4	11½	11½	North Middlesex 10 p.c.	155—160	..	..
91,530	"	"	8½b	8½b	Do. 7 p.c.	112—117	..	..
300,000	Stk.	May 6	9	7	Oriental, Ltd.	96—101	..	..
188,120	"	June 24	7⅞	7⅞	Plym'th & Ston'house 5 p.c.	108—113*	..	..
60,000	50	Mar. 4	14	14	Portsea Island B	90—95	..	..
100,000	50	"	13	13	Do. C	88—93	..	..
2,289,909	1	—	—	—	Primitiva Ord.	9/6—10/6	−/3	..
282,200	100	June 1	4	4	Do. 4 p.c. Red. Deb.	83—85	..	9/8—9/7½
600,000	Stk.	Jan. 21	4	4	Do. 4 p.c. Red. Deb. 1911	66—68	..	84½
180,305	"	June 24	4	4	Do. B. Aires 4 p.c. Rd. Db.	65—67*	..	..
256,847	"	"	4	4	Do. R'r P'te 4 p.c. Rd. Db.	65—67*	..	..
150,000	"	"	4	4	San Paulo 6 p.c. Pref.	7⅜—8	..	..
125,000	10	Mar. 18	6	6	Do. 5 p.c. Red. Deb.	43—46*	..	7⅝—8
270,000	50	July 1	5	5	Sheffield A	98—100e	..	..
419,968	Stk.	Mar. 18	5½	6	Do. B	98—100e	..	..
1,047,000	"	"	5½	6	Do. C	98—100e	..	..
90,000	"	"	5½	6	South African	5—7	..	..
6,609,895	"	June 11	4	—	South Met. Ord.	92½—94½	..	..
1,895,445	Stk.	Mar. 4	5	7	Do. 3 p.c. Deb.	56—59	−½	93½—94½
734,000	"	Jan. 7	3	3	Do. 6½ p.c. Red. Db.	102—104	..	..
91,500	"	Mar. 4	6½	8	South Shields Con.	117—119d	..	..
1,187,795	"	Mar. 4	8½	8½	South Suburban Ord. 5 p.c.	98—101	..	..
368,837	"	Mar. 4	6½	6½	Do. 5 p.c. Deb.	92—95*	..	..
647,740	"	June 24	5	5	South'mpton Ord. 5 p.c.max.	77—80	..	..
121,275	"	Mar. 18	5	5	Do. 4 p.c. Deb.	68—73*	..	..
250,000	"	June 24	4	4	Swansea 7 p.c. Red. Pref.	99—102	..	..
200,000	"	Mar. 4	7	7	Do. 6½ p.c. Red. Deb.	99—101*	..	..
120,000	"	June 24	6½	6½	Tottenham District A 5 p.c.	108—113	..	..
882,275	"	Feb. 18	7⅜	7⅜	Do. B 3½ p.c.	88—91	..	..
150,000	"	"	5⅞	5⅞	Do. 5½ p.c. Pref.	101—103	..	88—89½
181,255	"	"	28/4	5½	Do. 4 p.c. Deb.	73—76	..	..
258,251	"	June 10	4	4	Tynemouth Con. and New	67—68d	..	..
"	"	Mar. 18	5	5	Uxbridge, Maidenhead, & Wycombe 5 p.c.	90—95	..	..
197,294	"	Mar. 4	6⅝	6⅝	Do. 5 p.c. pref.	82—87	−3	82
88,330	"	"	5	5	Do. 5 p.c. Maidenh'd	87—92	..	87
91,800	"	"	6⅝	6⅝	Wandsworth, Wimbledon, and Epsom—			
30,000	"	Mar. 4	8½	8½	Wandsworth A 5 p.c.	123—128	..	..
255,636	"	"	7	7	Do. B 3½ p.c.	103—108	..	..
412,450	"	"	5/19/0	5/19/0	Do. C and New	88—93	..	103
352,000	"	"	6⅝	6⅝	Wimbledon 5 p.c.	98—103	..	..
98,000	"	"	7⅛	7⅛	Epsom 5 p.c.	105—110	..	100
88,416	"	June 24	3	3	3 p.c. Deb.	54—57*	..	..

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *Ex. div.
† Paid free of income-tax. ‡ Plus 8½ p.ct. p.a. special dividend.

An unusual event in the Gas Market was the announcement of the sale to three financial houses of the whole issue of £1,642,770 Gas Light and Coke Company's 5 p.ct. Debenture Stock at 98 less ½ p.ct. commission. While this mode of issue was doubtless considered to be of advantage to the Company, one cannot help feeling that gas stock investors would have appreciated an opportunity of tendering for the issue. There is little of importance in the quotation changes to record. The Gas Light and Coke ordinary fell away 1½ points, possibly on rumours of further opposition to the Company's Bill when it reaches the Upper House. The fall of 3 points in the Uxbridge Company's 5 p.ct. preference is surprising; and at the present average price of 84½, yielding nearly 6 p.ct., the stock is attractive.

The following transactions were recorded during the week:

On Monday, Bournemouth 4 p.ct. debenture 76, Commercial 4 p.ct. 79½, Continental Union 27½, 7 p.ct. preference 87, Gas Light and Coke 85, 85½, 86¼, 4 p.ct. preference 76½, Hong Kong and China 20¼, Maidstone 5 p.ct. 115, 115⅞, Montevideo 77½, Primitiva 4 p.ct. debentures 84¾, South Metropolitan 93½, 94¼, Tottenham "B" 88, Tuscan 22s. 6d., Uxbridge 5 p.ct. preference 82, 5 p.ct. Maidenhead 87, Wandsworth "B" 103. Supplementary prices, Walton-on-Thames and Weybridge "A" 14¼, "B" 10⅜.

On Tuesday, Commercial 4 p.ct. 79¼, Continental Union 28½, Croydon 96, 97, Gas Light and Coke 85, 85⅛, 85½, 85⅜, Hornsey consolidated 3½ p.ct. 66, Imperial Continental 123, 123¾, 124, Primitiva 9s. 6d., Tuscan 20s. Supplementary prices, Hornsey 5 p.ct. 85½.

On Wednesday, British 101, 101½, Gas Light and Coke 84¼, 84½, 85, 85¼, 4 p.ct. preference 77¼, 3 p.ct. debenture 58½, Hornsey 3½ p.ct. 67½, Primitiva 9s. 6d., South Metropolitan 93¾, 93⅞, Tottenham "B" 88, 89½. Supplementary prices, Hornsey 5 p.ct. 87½.

On Thursday, Alliance and Dublin 78½, 79½, 80, Commercial 3 p.ct. debenture 55, Gas Light and Coke 83½, 84, 84¼, 84⅜, 84⅝, 85, 3 p.ct. debenture 58½, 59, Hastings and St. Leonards 3½ p.ct. 72, Imperial Continental 124, Primitiva 9s. 4½d., 9s. 7½d., San Paulo 6 p.ct. preference 7⅛, 8, Wandsworth, Wimbledon 5 p.ct. 100. Supplementary prices, Crowborough 6 p.ct. debenture 73½, Gas Light and Coke 5 p.ct. debenture 99.

On Friday, Bournemouth 3 p.ct. debenture 57½, European 5½, Gas Light and Coke 83¼, 83½, 83⅝, 84, 5 p.ct. preference 76½, 76¾, 77, 77½, 78¼. 3 p.ct. debenture 59, Imperial Continental 124, Malta and Mediterranean 5⅛, 5⅛, Primitiva 9s. 3d., Tuscan 20s., Uxbridge 5 p.ct. preference 87. Supplementary prices, Colonial Gas Association 22s., Crowborough 6 p.ct. debenture 74, Gas Light and Coke 5 p.ct. debenture (int. from July 8, 1926) 99.

There were abundant supplies of money available in Lombard Street last week; and in the afternoon on Friday borrowers were able to obtain accommodation at as low as 3 p.ct. A large amount due to the Bank of England was repaid. The average rate at which Treasury Bill allotments were made was £4 3s. 3·19d. p.ct., which was about 1s. 9¾d. below the rate for the previous week, and the lowest rate since Feb. 26.

The uncertainty of the French franc dominated both the Belgian and Italian exchanges. In a downward rush on Friday a new low level was created at 183⅛. This was followed by the Belgian rate touching 187, and the lire finished at 140⅜. The schemes of M. Caillaux are somewhat obscure, and there appears to be no confidence displayed. Sterling on New York was easier, and closed at 4.86 15/32.

Silver continued to advance, and reached 30 5/16d. per oz. Gold remained unaltered at 84s. 11½d. per oz.

The Bank Rate is 5 p.ct., to which it was raised from 4 p.ct. on Dec. 3. Bankers' deposit rates are 3 p.ct. The deposit rates of the discount houses are 3 p.ct. at call and 3¼ p.ct. at notice.

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